AMERICAN BEE JOURNAL

JANUARY, 1919

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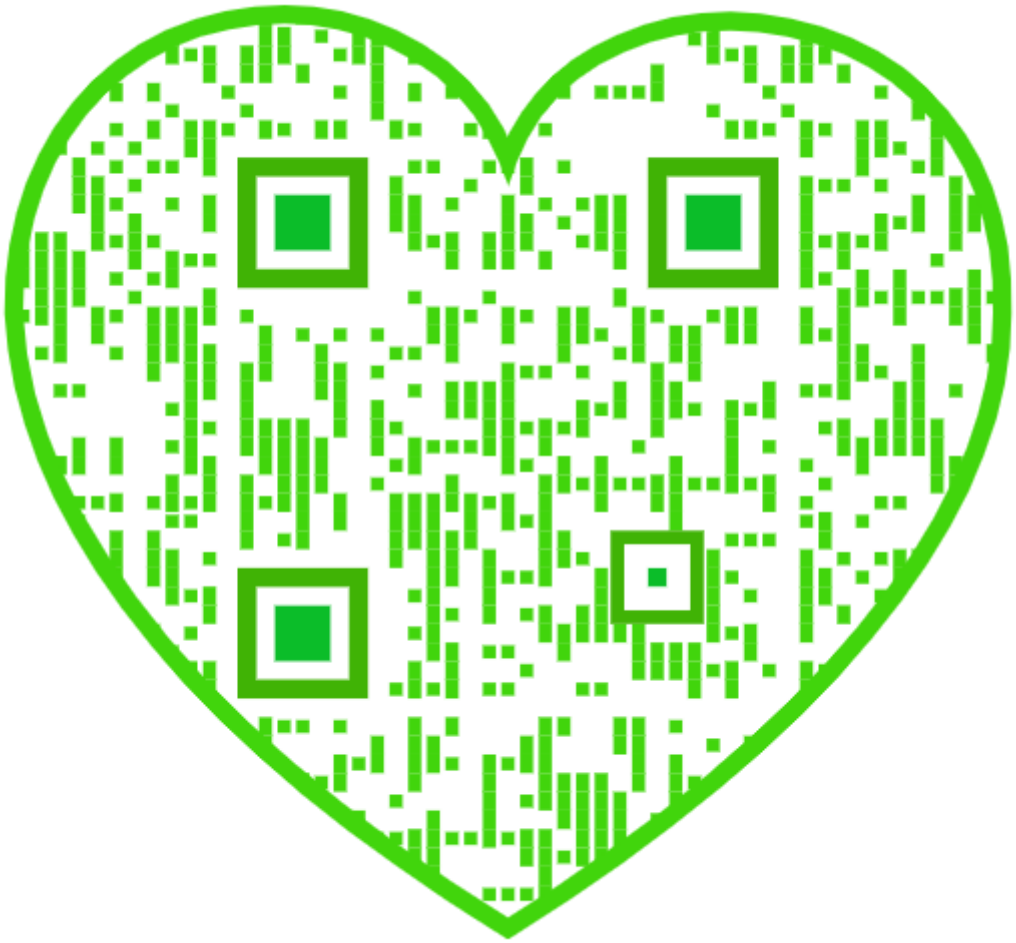
The exhibitors were: A. D. Raffington, J. A Nininger, Roy Bunger, A. V. Small, W. A. McCormick and C erdale Apiary



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AMERICAN BEE JOURNAL

VOL. LVIII—NO. 1 HAMILTON, ILL., JANUARY, 1919 MONTHLY, $1.00 A YEAR

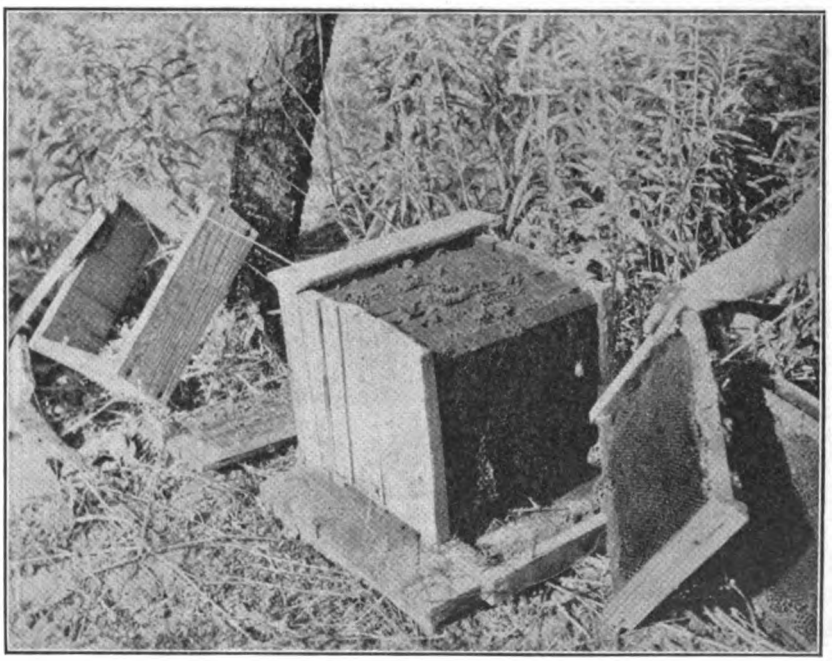
HONEY PRODUCTION IN KANSAS

Glimpses of Conditions in the Sunflower State, Where Alfalfa and Sweet Clover Are Rapidly Extending the Area Where Beekeeping is Commercially Profitable

THOSE whose impressions of Kansas have been formed from tales of disaster from drought and grasshoppers that overtook the early settlers of a generation ago, until it came to be known as "Bleeding Kansas," will hardly be prepared for the real Kansas as it is today. Big fields of alfalfa and wheat, herds of sleek cattle and fat hogs are making of Kansas one of the richest of the agricultural States. It is the extension of the area devoted to alfalfa and sweet clover that is attracting the attention of the beekeepers to that State. The Kansas climate is hot and dry during the summer months. It often happens that there is a deficiency of moisture during the crop season. Alfalfa and sweet clover will both endure continued dry weather without serious injury, once they are well established. The extreme heat, together with a dry atmosphere seem to furnish the ideal condition for secretion of nectar from both these plants. If only sufficient moisture remains at the roots to maintain the vigor of the plants a honey crop is almost unfailing under these conditions. The root system of the common white clover or Dutch clover is too shallow to survive the dry summers, except for an occasional season with more than average rainfall. White clover is not much depended upon as a source of honey, and where sweet clover or alfalfa are not grown honey production is an uncertain business. Horehound, heartsease and horsemint are additional sources in many parts of the State which go far to insure success.

As yet the suitable localities for commercial beekeeping are not large in extent. One county may contain good bee pasture, while the next may furnish insufficient pasturage for large apiaries. Like all the States in the central west, beekeeping is in a state of change from the back-yard row of hives to the commercial apiary. In only a few localities are there large commercial apiaries. The success of a good beekeeper is the best remedy for box hives. Where a man is making a conspicuous success of honey production and it is apparent that he is making a good living from the business, the box-hive beekeeper is quite likely to become dissatisfied with the small returns possible with such primitive equipment and either improve his methods or abandon the bees altogether. This is especially true in good farming country where general prosperity is the rule. A man who keeps other equipment on his farm up-to-date, is not proud to have a lot of bees in boxes under his apple trees when his neighbor has good hives and gets a far larger return from the apiary. The writer has noticed this tendency in every locality where commercial beekeeping is being carried on successfully. There are fewer beekeepers in such localities every year, because of the dropping out of the old-timer who does not have sufficient interest to master the new way.

Commercial orcharding is being de-



A relic of the old days. Closed end frames that were wired together serve the purpose of a hive. With a board for a top, no body was used.

15090

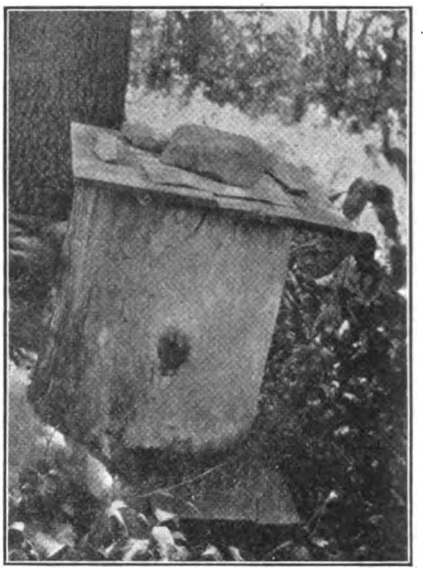
veloped quite profitably in Kansas and in the vicinity of the large orchards beemen sometimes find excellent locations. The Baxter brothers combine beekeeping with apple growing near Ft. Leavenworth. While this kind of combination offers very satisfactory possibilities, there are but few men as yet who have developed the combination on an extended scale. The fruit men are no longer inclined to overlook the value of the bees at blooming time, and not infrequently an orchardist and a beekeeper will combine forces to mutual advantage.

An article in our November issue gave an account of the special conditions in the Arkansas valley. Similar locations are to be found in the valleys of some of the smaller streams in the eastern section of the State. At Emporia the boys' and girls' clubs, under the leadership of Charles A. Boyle, have a membership from all parts of the county. It is readily apparent that members in some sections of the county have a great advantage over others, because of a more favorable location. At Augusta, Carl F. Buck has several outyards which yield a good surplus almost every year. Almost anywhere in eastern Kansas there seems to be a sufficient flora to support the bees, but the amount of sweet clover and alfalfa within reach seems to determine the surplus over most of the territory where the writer has visited.

At Eskridge, Roy Bunger and wife devote their entire time to beekeeping. They are buying large numbers of bees in box hives and transferring them, thus removing many uncared for bees from the locality, while increasing their own apiaries. Bunger is assisting many of his neighbors in getting their bees in shape for proper management.

At Blue Rapids the writer attended a field meeting which was attended by an enthusiastic lot of beekeepers, both men and women. W. E. Axtell, of that place, has been influential in developing local interest in field meetings at that point. While Mr. Atkins was engaged in extension work in Kansas, under the U. S. Department of Agriculture, the Blue Rapids beekeepers made good use of him in connection with their field meetings. Although extension work has been under way for only one season, it has shown results which are highly pleasing to those who have been influential in getting it started. The Kansas boys' and girls' bee clubs under Mr. Boyle's leadership have been among the most successful and have attracted wide attention. We plan to give an extended account of the organization and results of this club work in a later issue.

The study of locality as applied to beekeeping offers some very interesting possibilities. The fact that a considerable variety of well-known honey plants are present does not always insure a crop. The influence of soil and climatic conditions is far more important than has been generally understood. Kansas is farther west than Missouri and has a lighter rainfall, yet apparently Kansas is by far the better State for honey production. The writer is inclined to regard Kansas and Nebraska as among the best States for beekeeping. True, neither of them is, as yet, far advanced in the establishment of commercial apiaries, but the few extensive honey producers are getting large crops and with surprising regularity. It should be borne in mind, however, that there are very large areas in both States that are not suited to beekeeping on a large scale. The prospective apiarist should be exceedingly careful in choosing a location in either State.



The hollow log hive has not yet disappeared from Kansas.

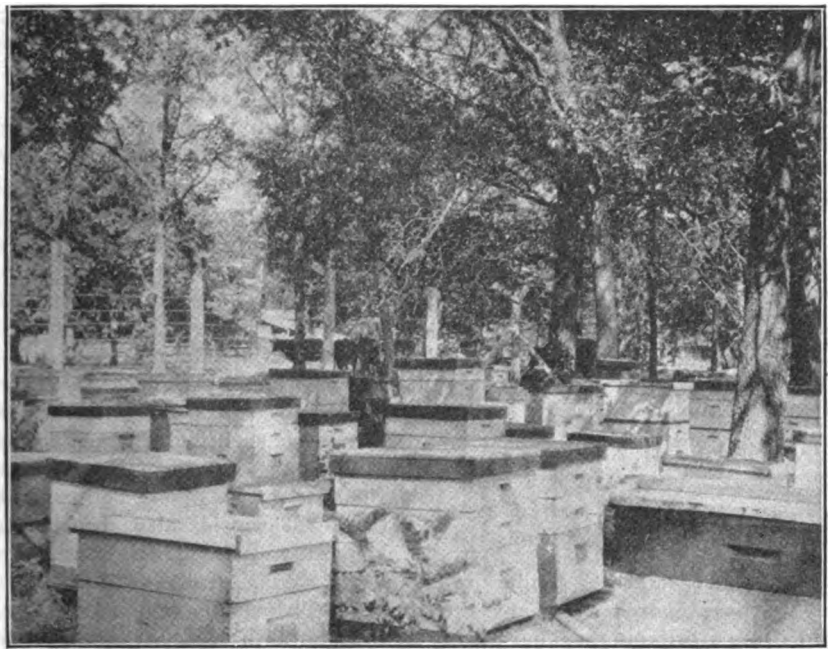
Roy Bunger and wife, extensive honey producers at Eskridge.

Field meeting of Kansas beekeepers at Blue Rapids.

The Langstroth and Jumbo Hives

By G. Bohrer

ON the first page of the American Bee Journal for November appears the picture of Moses Quinby and an article by the editor. The picture and article bring back to my memory a conversation I had with Mr. Quinby at a convention of beekeepers held at Cleveland, Ohio, during the winter of 1872. I had used the Quinby hive. It was of the eight-frame pattern. The frames of this hive were two or more inches deeper than the Langstroth frame and an inch or more longer. I asked him why he made his frame both deeper and longer than the Langstroth frame. In reply he said: "Where I reside, in New York, the winters are long and the cold snaps



Apiary of O. A. Keene, Secretary of the Kansas Association.

are protracted, and you know bees go into winter at the lower and front part of the hive. In case they consume all the honey in the combs occupied, back to the rear end of the hive, and the combs on either side of the cluster of bees are covered with frost, they cannot reach it and will perish of starvation. With the frames as I use them," said he, "there is more honey above and to the rear of the cluster."

His logic could not be controverted successfully. I at once concluded to use his frames more extensively than I had up to that time. But before I did so I determined to move from where I then resided to central Kansas, which I found not adapted to beekeeping, as there were no honey-yielding plants in this part of the State. I therefore kept no bees until fruit trees began to bear and alfalfa had been introduced. Then I began again keeping bees and have adopted the Jumbo hive body as a broodnest. Bees winter quite well in it. In what are known as the Southern States the Langstroth frame is deep enough, the winters being shorter and milder. So there is no real danger of the bees being caught in the rear end of the hive with the combs frost-covered on either side of the cluster.

Like the writer of the article I have referred to, I find the Jumbo hive containing ten frames better adapted to brood rearing, as it affords more cell room for the use of a prolific queen. A queen that cannot populate a brood nest as large as the 10-frame Jumbo hive is not likely to be of much value.

I have used, and am still using, a few 14-frame Langstroth hives, as such hives afford about as much cell room as the Jumbo 10-frame hive. I find that nearly all the queens in these 14-frame hives fill the cells about as full of brood as the Jumbo. I use these hives for storage purposes by piling one to three bodies on top of each other. With a strong colony of bees in the lower story, they care for the honey until I get ready to extract, which is not at all times convenient.

As a super I use the standard Langstroth hive body, which is a fraction over two inches deeper than the super of the Dadant hive.

As to the use of the queen excluder, I find it almost unnecessary on the Jumbo hive, while on the Langstroth hive about all the really prolific queens go above in search of cells to lay in. So I use the excluder on the few Langstroth hives I have. I have, however, so far failed to notice that the excluder impedes to appreciable extent the matter of ventilation.

In regard to requeening, I have left the bees to attend to this duty. I had one queen to do good work for three seasons. The fourth season the bees superseded her. As far as my observations have enabled me to judge, the bees are not likely to supersede a queen unless she shows unmistakable evidence that she is falling short in keeping up the ordinary strength of the colony.

I have been a patron of the American Bee Journal ever since its first copy was published, and have kept bees during all these years. except the first ten years after locating in Kansas.

The past season, with hives of the capacity I have mentioned, I took, with an extractor, from nine colonies of bees and their increase, 1,250 pounds of fine alfalfa honey and sold nearly all of it at 25 cents per pound.

Chase, Kans.

(Dr. Bohrer is 86 years old, just a little younger than Dr. Miller, and about as vigorous.—Editor.)

A Letter From Ohio

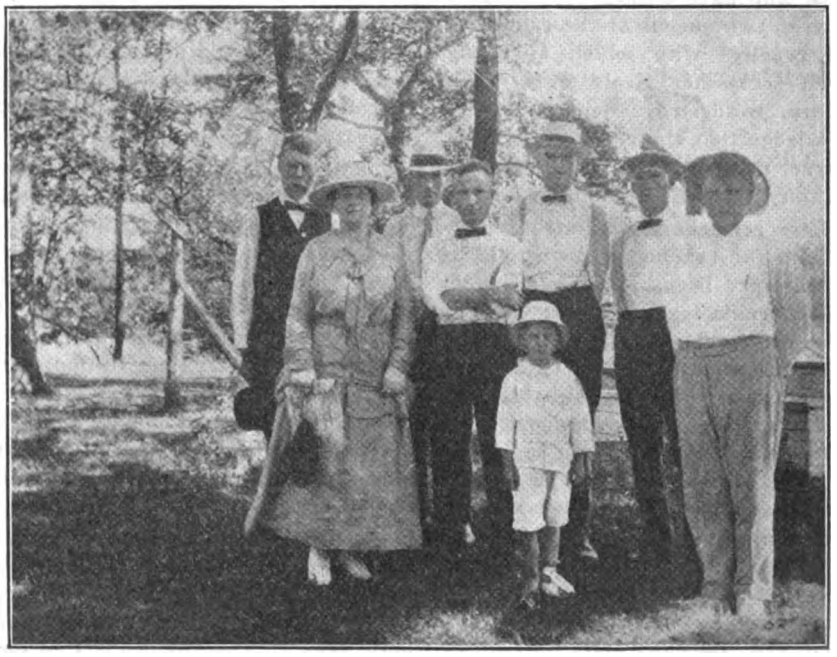
Having kept bees periodically for forty years, I am writing the following suggestions:

Why not use a double or continuous frame for the brood-chamber, so that the queen, being easily disturbed by obstructions, could have continuous laying space in upper and lower stories? The result of this plan is to increase the amount of bees as well as the storage of honey.

My way of introducing virgin queens is to take away all the brood and eggs and make the bees anxious for a queen.

For wintering, it is my opinion that bees are often covered too warm, or rather too much moisture is held by the covering. This freezes and later melts to drip down over the cluster, making moldy combs.

J. A. DOUGHERTY,
California, Ohio.



A group of bee lovers at the Keene apiary at Topeka.

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language. Consolidated with The National Bee Journal in 1874.

Published monthly at Hamilton, Illinois.

Entered as second-class matter at the postoffice at Hamilton, Illinois.

SUBSCRIPTION RATES—In the United States and Mexico, $1 per year; three years, $2.50; five years, $4. Canadian postage 15 cents, and other foreign countries 25 cents extra, per year.

All subscriptions are stopped at expiration. Date of expiration is printed on wrapper label.

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THE EDITOR'S VIEWPOINT

The Deadly Female

When Kipling wrote that "the female of the species is deadlier than the male," he probably had not been informed as to the truth of that assertion in the generation of the bee. We all know that the male or drone has no sting, that he is perfectly harmless, trusting only to his power of flight to sustain him in his amorous propensities. On the other hand we know that every neuter or worker is an undeveloped female, each possessing a sting capable of inflicting unpleasant wounds and of killing other workers, besides insects, mice, etc. The perfect females, the queens, who have a curved sting, are not fitted for defending themselves against any attacks except those of other fully developed female bees; but those who have witnessed the fights between two queens or the eagerness and cruelty with which a young queen seeks her rivals, even when unborn, to destroy them, must acknowledge that the Kipling assertion is true, that the female honeybee is certainly "deadlier than the male."

These remarks are brought about through the reading of an article in the Literary Digest of November 16, in which Professor Glaser, of the University of Michigan, quotes genealogical studies by Major Charles B. Davenport, "indicating clearly that efficiency in fighting is far more likely to be passed along the maternal than the paternal line of the family. The genius of Caesar, the career of Napoleon, the brutality of Nero, are all traceable to maternal inheritance."

But although the female of the bee is "deadlier than the male," there are some peculiarities of inheritance which do not indicate similar results to those quoted above, by the authorities ascribing deadlier propensities on the maternal side in the human race. Here are a few remarks made among bees:

At the International Congress of Beekeepers held at Paris in 1900, to which I was a delegate from the United States, a French priest, whose name now slips my memory, made the assertion that the characteristics of temper, or gentleness, in bees, were transmitted through the male. He asserted that a black queen, mated with a drone of the pure Italian race, would transmit to her worker daughters, and of course to her queen daughters, the gentle disposition of the Italian bee. On the other hand, an Italian queen, mated with a drone of the restless and cross common bee, would produce bees and queens who would have the same restless and irritable disposition as the black bees from which her mate was issued.

We all know that hybrids from an Italian queen are cross. After the above meeting, I took pains to investigate the behavior of bees produced by the mating of black queens with pure Italian drones, and I found that the theory worked. It was not difficult, at that time, to find such hybrids, for we had numerous neighbors who had never bought an Italian queen, whose bees were almost pure Italians, through mating with our own Italians.

Since that time, I have been inclined to believe that the cross-tempered "Goldens" may be the result of crosses of pure Italian bees with drones of the irritable Cyprian bees.

It would be interesting to know whether others have made similar remarks, or whether the above experiences were only accidental.

However this may be, the fact remains that, among bees, certainly, "the female of the species is deadlier than the male."

The Oldest Bee Periodicals

Our contemporary bee magazine, L'Apicoltore, of Milan, Italy, in its September number, quotes a statement in our September 1916 number, in which we mention L'Apiculteur of Paris and the American Bee Journal as being the two oldest bee periodicals in the world, also mentioning Gleanings and the British Bee Journal as having been established in 1873. L'Apicoltore reminds us that it was born in 1868. We knew this and mentioned it in October, 1916, and again at the time of L'Apicoltore's golden jubilee, in April, 1917. The mention of Gleanings and the British Bee Journal was not intended to describe them as the next in age to the American Bee Journal. Several bee papers, including L'Apicoltore, were established in different parts of the world between 1861 and 1873. In July, 1917, we mentioned 6 American magazines on bees which were established between those dates. There were also European magazines, especially German and French, but all have closed their careers. So L'Apicoltore may truly claim to be the third oldest bee magazine in existence. Long may it live!

Change in Texas Conditions

Copious rains in the last few weeks have changed conditions materially in Texas. Many beekeepers were looking forward to a dismal prospect of dry weather, honey dearth and much feeding if colonies were to be saved at all.

Now all is changed. Bees have made considerable honey this fall. In nearly all instances they have filled the brood-chamber so that they will have plenty of honey to winter upon, and in many cases considerable increase has been made and a surplus from the fall flowers extracted.

It is yet too early to indicate just what effect this will have on beekeeping in Texas in 1919, but one has but to read the last issue of the progressive "Beekeepers' Item," published and edited by Louis H. Scholl at New Braunfels, Texas, to see that

everyone is elated at the prospect of a return to normal conditions in that great bee state.

Those California Short Course Meetings

Our associate, Mr. Frank C. Pellett, has spent the whole of the month of December in attendance at the California short courses, where he was on the program for a series of lectures on Bee Inspection and Bee Laws.

All reports coming from him are that this series of lectures is the best he has ever attended, both in point of numbers in attendance and in scope of work outlined.

We hope to be able to give more general information in our February and March numbers.

An Italian Acknowledgement of Services Rendered

The following resolution by an Italian Beekeepers' and Silk Growers' Museum organization, sent to Washington, was forwarded to us from the Bureau of Entomology, for publication. It gives another illustration of the present feeling in Allied countries, towards the help received, on the battlefields of France and Italy, from the United States:

The Directing Council of the International Museum of Apiculture and Sericulture in Turin, in its solemn session of October 30, 1918, expresses to the great Wilson and to his collaborators, as well as to all the apiculturists of the United States, its sentiments of high esteem, admiration and recognition of the noble deeds which they have performed in Europe for the cause of justice and the peace of the nations.

Minnesota Inspection

The Minnesota Inspector of Apiaries has published his fourth annual report. It contains a summary of the season's work, a description of foulbrood with cuts, the treatment of both forms of the disease and the Minnesota foulbrood law. It also contains an interesting article from Mr. Carl B. Stravs on the honey exhibit at the State Fair, with recommendations of more extensive exhibits. Beekeepers who expect to thrive in the business should secure this report. Address Chas. D. Blaker, State Apiarist, 4420 Grimes Avenue, Minneapolis.

Hawaian Beekeeping

"The Hive Bee," is the title of a neat pamphlet of 36 pages published by E. C. Smith, Manager of the Garden Island Honey Company, near Honolulu. The pamphlet is well illustrated and contains some interesting information on honey production in the Islands. It reports the annual output of the apiaries of the Islands at about one thousand tons of honey and twenty-five tons of wax from approximately 20,000 colonies. The honey is, for the greater portion, of dark color and of a molasses-like taste. Insects, especially moths, ants and cockroaches, are the greatest hindrances to profitable beekeeping.

English Notes

The "Journal of the Board of Agriculture," published in London, contains, in its October 1918 number, 5 pages devoted to bees—feeding for winter, uniting weak nuclei, making syrup, etc.—all practical hints and advice. But the most interesting part of this interesting journal is, to us, the 58 pages devoted to "Women in Agriculture." Indeed, women have shown their ability, during the strenuous days, not only in beekeeping, but in nearly all pursuits in which men succeed. Although it is true that each sex has a more special sphere of work, we cannot deny that women have demonstrated their ability in many lines where they were formerly considered of little worth. The discernment with which they used the "school vote" in Illinois, some years since, has had a great deal to do with the success of equal rights. Welcome to the women, not behind the men, but at their side, hereafter!

Bees on Shares

The excellent bee magazine, "The Australasian Beekeeper," published at West Maitland, New South Wales, contains in its September number a prize article which we reproduce in this issue. It is very judicious. In truth, "much depends on the apiarist." An efficient man is worth more than half the crop and a neglectful man is of little or no value.

I remember taking care of bees on shares for half of the crop, in my young days, when less than 25 years of age. I had overestimated my ability, in an attempt to care for a number of apiaries many miles apart. It was before the time of automobiles, with bad roads. I came to the apiary in question on a fine June day, when the bees, crowded for room, were swarming strenuously. The owner, a hard-working old farmer, told me plainly that I was not earning my share of the crop. I readily acknowledged my shortcomings, explained the situation and offered to change the conditions of the contract so as to give him entire satisfaction. He was so well pleased with my explanation and my willingness to do the fair thing that he replied immediately:

"Bah! Do the best you can after this and I'll call it square. You're the right kind. You're all right."

The work went on, the bees were supplied with needed supers, the crop was good and we both had cause to be pleased with the results. That old farmer was one of my best friends afterwards, as long as he lived.—C. P. D.

Bee Physiology

We translate the following from the "Apicoltore Moderno," of Turin, Italy, in its May, 1918, number:

"Abbott Collin ascertained that when queenless colonies are deprived of worker larvæ less than 3 days old, they build queen-cells around drone larvæ instead of worker larvæ. This is because, at this age, the worker larvæ no longer receive the milky food which is given during the first 3 days; while the drones, being slower in development, are still fed with it.

"The size of the pollen pellets carried by the workers of a colony, at any time of the year, but especially in spring, is a valuable sign to recognize the condition of the colony. The bees that do not have any brood to feed, or have but little, do not carry heavy loads of either pollen or honey. So a colony whose bees are seen with their pollen baskets heavily loaded with pollen certainly has a vigorous queen."

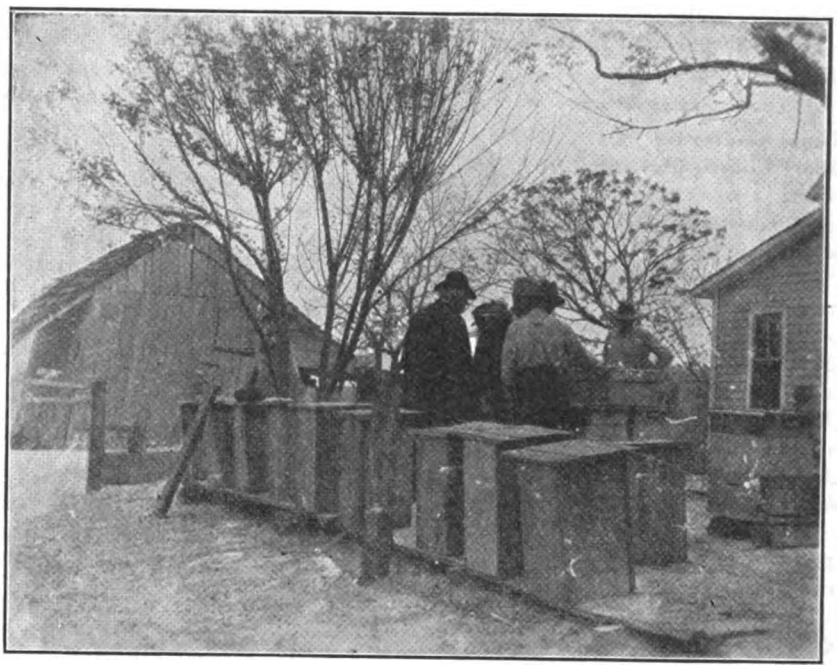
We all know that a colony whose bees do not carry pollen in spring, or carry very little of it, is likely to be queenless.

Avoyelles Parish Beekeepers' Association

On Saturday, December 7, a number of beekeepers met at Marksville Parish seat and organized a beekeepers' asociation under direction of Mr. E. C. Davis, Bee Extension Agent for Louisiana. J. F. Archdekin was elected President and Mr. L. C. Mayeux, Hamburg, La., Secretary-Treasurer. The purpose of the association is to sell honey and wax and buy supplies for the members.

J. F. ARCHDEKIN,
Big Bend, La.

Organization for Disease Control in Texas



Transferring the bees is a big job in some sections. The inspectors are responsible for a great advance in Texas beekeeping.

TEXAS is a big State in area. It is second only to California in the importance of its beekeeping industry. Accordingly we are not surprised to find the largest organization with centralized control, for dealing with bee diseases, of any State. The work of eradication of bee diseases is placed in charge of the State Entomologist. Since he is also charged with control of insect pests, he places the bee disease problems in the hands of a chief inspector who has no other duties to perform. Under this chief inspector is a force of forty local inspectors who are responsible for the field work.

The Texas law is very stringent, giving unlimited authority to the State Entomologist. Not only is he able to enforce all the provisions specifically set out in the statute, but he is also given authority to make such additional regulations as may be needed. On this point the law of Texas reads:

> "Shall have full authority to make, promulgate and enforce such rules, ordinances, orders and regulations, and to do and perform such acts as, in his judgment, may be necessary to control, eradicate or prevent the introduction, spread or dissemination of any and all contagious diseases of honeybees."

The specific statutes relating to control of bee diseases are long, consisting of more than twenty sections of the law. Special provision is made to prohibit the shipping of any bees, equipment or honey into the State, without a certificate from duly constituted authority, to the effect that they are free from disease. Railroad companies are prohibited from receiving for shipment either bees, combs or used equipment from place to place within the State except under such regulations as shall be prescribed by the State Entomologist. The officials are given full authority to examine any bees in transit at any point within the State and to seize and confiscate them if found diseased. Further authority is given to establish quarantine against the shipment of bees or honey into or out of any district which may be designated. This is to prevent the introduction of disease into any territory that may be free from it, or to prevent its spread from localities where it is known to be present.

Officials in charge of Texas beekeeping, left to right, W. E. Jackson, chief inspector; S. W. Bilsing, instructor in beekeeping at the college; F. B. Paddock, State Entomologist.

The Entomologist has authority to make it unlawful to keep bees in other than movable-comb hives in any part of the State where he finds it necessary in the discharge of his duties. He may burn bees, hives and honey, if he sees fit, in order to eradicate the disease from any part of Texas.

In meeting any emergency, it is necessary to centralize authority and the Texas people have given the entomologist a great deal of latitude in dealing with bee diseases. Inspection laws have been passed for the benefit of beekeepers, and at their request. What beekeepers want is protection against the spread of disease, and this is the sole object of the law. The results obtained depend upon the manner of administration. Prof. F. B. Paddock, who is responsible for the administration of the Texas law, takes the view that it is useless to spend the State's money in fighting disease in localities where the beekeepers are not interested. He accordingly makes a requirement that the beekeepers be organized in every locality where inspection is undertaken. He regards the co-operation of the local association of prime importance in cleaning up disease. In the selection of a local inspector he

requires that the county organization, in the county where the work is to be done, designate two or more men who will be satisfactory to the local beekeepers. After careful investigation he selects the man who seems best fitted for the work. Since the selection is made from a list of candidates endorsed by the association, there is no reason for complaint because of an unwelcome appointment.

In selecting an inspector several things must be borne in mind. In the first place it must be clear that the candidate is an expert beekeeper who is competent to deal with disease and to give advice on any phase of beekeeping when necessary. Not only this, but it is highly important that the inspector be in position to respond promptly at the proper time. A man may be an expert beekeeper and unsuited to the work because his own business is likely to require his attention at critical times. It often happens that general inspection will not be possible for weeks at a time because of unfavorable conditions, such as robbing for lack of honey in the field, or continued wet weather. Following such a period the man with large apiaries and insufficient help is likely to spend the most suitable days with his own bees.

Again, it is important that the inspector be a good judge of human nature and able to get results without stirring up antagonism on the part of men who need his help. The selection of such a large force of field men as Professor Paddock employs is in itself a very difficult task. The chief inspector goes from county to county, giving assistance and counsel wherever needed and supervising the field work. W. E. Jackson, the present chief inspector, has been called to the army, so that the work has been hampered seriously on this account.

When work is begun in a county the amount of work needed is estimated as nearly as possible in advance and the necessary expenditure authorized. It is thus possible to approximate the yearly expenditure very closely and to keep within the appropriation. The inspectors begin at the center of infection and gradually extend the circle to the limit of infection. They are expected to be very thorough in their work and to examine every comb in every apiary under suspicion. In queen-rearing apiaries, every colony is closely inspected, together with all bees within a mile, before the certificate is issued.

When the size of the State is considered, as well as the great development of beekeeping within its borders, it is difficult to realize the enormity of the undertaking to control bee disease within the borders of Texas. The writer spent nearly seven weeks visiting among the beekeepers of the State, yet was able to visit but a few of the counties. If the chief inspector should travel constantly, he would find it impossible to spend a day in each of the counties and return again the same year. Mr. Paddock and his assistants have a big job on their hands. Success to them.

A New Winter Case

By Chas. Reynders

THE advantages of the winter cases hereunder described, consist in that:

1. They are individual for each colony.
2. Colonies always remain on their stand.
3. There are none of the complications inescapable with cases for more than one colony, as for instance, exact leveling of the ground about the entrances, etc.
4. They are collapsible, so that during the summer they can be laid away, filling up inside of the 5½-inch deep cover, one stacked upon the other.
5. They can be set up for use or dismounted in two or three minutes.
6. They are substantial, light and durable.
7. It takes no more time to make one of these cases than it does to nail up a double-walled hive, as same arrives from the maker, in the flat.
8. While economical, this winter case with a well-made, simple wall hive, is equal to anything that can be bought in the way of double-wall hives.

Fig. 1 is to illustrate a 10-frame dovetailed hive body (a), with chaff tray (b) thereon, and cover on top (c); (ddd) is the bottom-board; (e) entrance-block, and (mm) apertures in latter.

The dotted lines around Fig. 1 are to indicate the 4-panelled winter case. In that same figure (hh) and (ii), indicate cross-section horizontal strips (2x½ in.), holding together the boards whereof the panels are made. (For the latter I now use stuff from high-class shoe boxes ⅜ inch thick), viz.; (hh) strips inside, resting on and along outer edge of bottom-board, as shown by Fig. 4 (kk), and (ii) horizontal strips on side, 5½ inches from upper rim of case (on top of panels); whereupon the cover of the winter case rests. The first of these covers have galvanized sheets; those I now make will have 3-ply asbestos roofing instead, because of too high cost of former. I use the asbestos roofing for the reason of being white.

It should be observed that the vertical dotted lines of Fig. 1 go down lower than bottom, thus underlapping, thereby excluding winds. It must, of course, be understood that the bottom-board rests upon a hive-stand, thus allowing the panels, other than the front one, going down lower than the bottom-board.

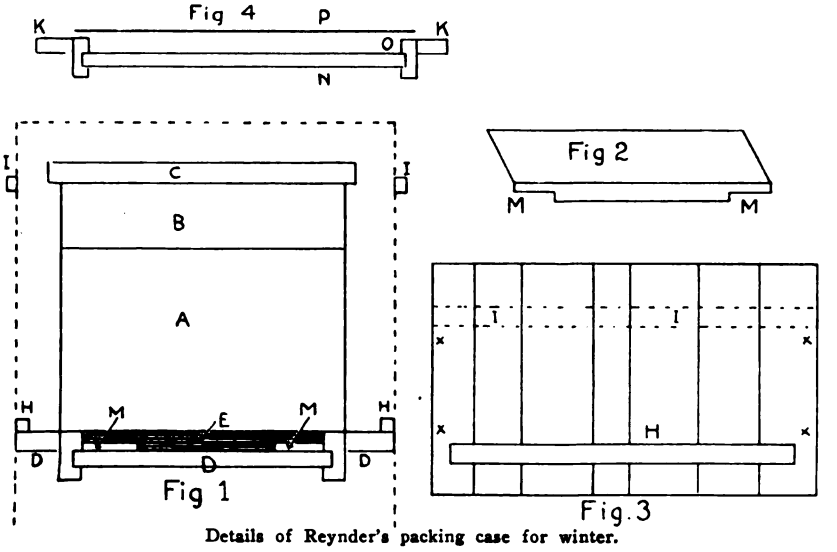
Fig. 2 shows entrance block, 14½x 2⅝ and ⅞ thick—the apertures are at each end, are half the thickness and each 2½ inches long; (mm); see also Fig. 1. Five thin nails are driven through (mm) for the purpose of keeping out mice, etc.. (It is remarkable what little space they can squeeze through, but the grate made by the nails does keep them out).

Fig. 3 shows one panel; (ii) shows the upper horizontal strip in dotted lines; the lower horizontal strip (h) can be seen, the upper one (i), being outside, cannot.

The side and rear panels are like Fig. 3 (the former 24⅞, the latter 20 inches, both 20¼ inches vertically. The front panel has horizontal strips on a level with the others, but instead of underlapping, the lower one rests upon the entrance-block, Fig. 2.

Fig. 4 shows the bottom-board by cross-section; "n" is ⅜ inch and "o" is ⅞ inch. At the rear there is a block like Fig. 2, but solid. Removal of both blocks generally provides amply for ventilation in summer.

The four crosses in Fig. 3 indicate where strap hinges are secured, 8 in all, inside. Half of the hinges, diagonally, are as they are bought, and half modified by filing off the underhead of the pins, so that by either inserting or removing them the panels are put together or taken apart, the latter by pairs. When in spring the winter case is to be removed, it has just to be lifted up from the hive, then in the diagonally opposite corners the pins with the lower head as filed off, need only be driven upwards enough to disengage the four hinges and by the other four hinges (left intact as bought) the four pan-



Details of Reynder's packing case for winter.

els are left in two pairs, collapsed and placed into the cover.

The extreme dimension of the bottom-board is 24½x20, and of the dovetailed hive 20x16¼.

At a certain time I concluded to have uniformity in bottom-boards throughout and adopted this (original) Buckeye board. I use it also with the Lewis Champion Hives, and not having had enough double-walled hives, because of unexpected increase, I used the same bottom-boards with single-walled hives, both dovetailed and home-made. I have never seen any disadvantage from the overlap (in summer) of the bottom-board (at sides and in front) beyond the single-walled hive bodies; in fact, as likely as not, my most productive colonies have happened to be in single-walled hives so adjusted.

I have boards that in summer I use for shade and in winter for windbreaks. In very hot weather removal of both bottom-board blocks seems scarcely sufficient for ventilation required; I then supplement by setting lower (comb) super an inch or so back of top of hive-body, the gap thus provided always fills the bill for ventilation.

Directions for making the winter case:

When used with dovetail 10-frame hive and Buckeye bottom-board, use ⅜-inch stuff and strips for the panels 2x½ inch.

Side panels: Vertically 20¼ inches. Length 24⅞ inches. Outside (upper) side slats, 24⅞ inches and 5½ inches from top. Inside (lower) side slats, 23⅜ inches and 2¼ inches from bottom, ¾ inches off from margin. Hinge blocks (2x4), 2 inches from top and ¾ inches off from margin.

Back panel: Goes inside of side panels; vertically 20¼ inches, width 20 inches. Outside (upper) slat overlaps ¾ at end (2½ inches long). Inside (lower) slat, 20 inches (flush). Hinge blocks, flush and 2 inches from top.

Front panel: Goes inside of side panels, vertically 18 inches, width 26 inches; top rim of same goes even with the other panels. Slats and hinge blocks, same as for back panel.

Cover, out of ⅝ in. stuff, 5½ in. deep, will just be filled up by the panels collapsed. Galvanized sheet or white asbestos roofing.

Ulster, Pa.

BEEKEEPERS BY THE WAY

Dr. J. H. Merrill, Mrs. Merrill and the "kiddies."

Merrill, of Kansas

It requires a peculiar type of man to be a successful teacher of beekeeping. He must be, not only an expert beekeeper, familiar with all the intricate manipulations necessary to make honey production successful under varying conditions, but he must be an enthusiast who is capable of arousing and sustaining the interest of his students.

Dr. J. H. Merrill, of the Kansas Agricultural College, measures up to this standard very nicely. One does not look far in Kansas without seeing some effect of his influence. As State Apiarist he is responsible for the bee inspection in the State, in addition to the teaching and experimental work at the college. The work has not been long under way, but is being developed in co-operation with the State Beekeepers' Association, the Boys' and Girls' Clubs, and other organizations interested in bees, thus reaching the greatest possible numbers of people.

Our picture shows Doctor and Mrs. Merrill at home with their two children.

Fifty Years Ago

Elisha Gallup in the American Bee Journal for January, 1869

AS I have a great many enquiries in regard to wintering bees, I propose to give my answer through the Bee Journal.

M. Quinby recommends a barn cellar and he gives a description of his in his book. But we do not all have such cellars. Mr. Robert Jones describes a very cheap house to winter bees in. I think that 10 or 12 inches of sawdust would be better than six for our northern climate. Mr. Thomas, of Canada, gives us another cheap plan. Mr. Wedge, of Wisconsin, uses a house with double board walls and a foot space between each, filled with straw dust, with perfect satisfaction. Chas. Dadant gives us his method of burying bees, and with his method of ventilating the trench there is no doubt but it will work well. If you put one tube in the top, or two of the same length, it is no ventilation at all. But put one in and let it come up through the covering of the roof and extend down to within an inch or two of the bottom of the cave, then put in another, letting it go down just through the covering and extend 5 or 6 feet above the covering and you have the very best of ventilation, with a strong curent of air.

A strong, large swarm, with abundance of honey and properly ventilated, will winter well on its summer stand; but it is almost impossible to give written instructions to new beginners that will winter every swarm, without as much trouble as it will cost to fix some of the repositories above mentioned. Our winters are so variable that the method that will work well in one winter would not answer the next, on the summer stand. With an especial repository, we have the winter under our control, and wintering reduced to an absolute certainty, with proper ventilation. A large number of swarms create a large amount of animal heat, and a small number create heat in proportion. So in ventilating we must take this into consideration and govern ourselves accordingly.

About wire gauze. If you fasten your bees in with fine gauze and one bee takes a notion that she wants to go out, she commences butting her head against the wire, and very soon communicates her agitation to others of the swarm, and they lose some of their number every time. Now, instead of the gauze, ventilate each hive just right, and you will not lose a dozen bees per swarm in the whole winter. If you are troubled or are afraid of rats or mice, use coarse wire that a bee can pass through easily, and still keep out the mice. I winter in the cellar, and yet ventilate each swarm so that I can go all around with a light and not a bee stirs or attempts to come out. If a large swarm is not peaceable, give more ventilation. If from a small swarm some of the bees come out and discharge every time you go into

the cellar, the inference is that there is too much ventilation.

Osage, Iowa.

Beginning in Extracted Honey Production

By Oscar Ritland

IF we are going to make the production of "Extracted Honey" our life work it is of the greatest importance to start right. For if we do not start right we cannot expect to succeed later on.

In this paper I will give some of the things which I think are important to anyone who is going to start in the production of "Extracted Honey."

First, I would provide myself with several of the leading textbooks on beekeeping and study them over and over again, and I would also subscribe for one or two of the bee journals. These ought to be preserved for future reference. I have every issue of the bee journals since I began taking them, and I refer to them constantly. New problems are continually coming up and in the back issues of the journals I can find a solution to most of them.

During the winter there is very little to do with the bees. Then is the time to make everything ready for the coming year. If any hives are to be made or bought, winter is the time to attend to that. Frames should be filled with foundation and everything gotten in readiness, for when summer comes we are usually busy, and what a satisfaction it is to have everything ready.

Finally spring draws nearer and we long for the time when we can work with the bees on the summer stands. If they are quiet in the cellar I think there need be no hurry about removing them. I would suggest about April 1 to 10 for central Wisconsin, depending upon the season. I like to have my bees out a few days before soft maples bloom. The queens usually begin laying about the time of removal from the cellar and there will be some brood when the first pollen comes.

From now on we want to do everything in our power to make the colonies prosper, so as to have them strong early. Every colony should be examined shortly after being placed on the summer stands. If any are found to be queenless the simplest way to dispose of them is to unite them with weaker colonies, having a queen. Any colonies found short of stores may be fed by giving a comb of honey saved from the previous fall for this purpose.

If the apiary is in a well protected location and the hives are well made, so there are no gaps at the corners, and the covers fit snugly, I doubt if it would pay to cover the hives with paper. But if it is in a windy place, or the hives are gaping at the corners, I think I would paper every time.

I do not fear a cold spell coming shortly after the bees are removed from the cellar as then there is only little brood in proportion to the mature bees. But after two or three weeks of nice weather the brood will have increased considerably while the mature bees will have decreased; then should a cold spell come, some of the brood is liable to chill. This is when the paper pays, and pays big, for we do not want the bees to have any setback at this time. If we cannot get them strong and overflowing with bees before the clover flow is well advanced we will lose part of the surplus.

All queens' wings are clipped before the colonies become too populous, and as I keep a record of every colony, I make a note of it in the book. I also keep a record of the number of frames of brood each colony has at each examination, which enables me to tell which colonies can spare brood in case I want to help a weak colony. I find there is quite a difference in the strength of the various colonies in the spring. Some have only three frames of brood, while others have seven or eight frames. In order that all colonies may be ready for the same treatment, at the same time, I draw nearly mature brood from the stronger and give to the weaker ones until all are prosperous.

As soon as a colony becomes strong enough so that it fills one story with bees, brood, pollen and honey, a second story should be given without excluder. If there is any doubt as to whether a colony actually needs another story, I would put it below the original brood chamber, for there it can do no harm, and as the bees need room they move down.

Royal palms near "Cubanacan," Indian name of the place where is located now the city of Santa Clara, Cuba. "Cubanacan" means heart or center of Cuba, and the Indians were right, as our city is in the middle of the island. Urbans Trista.

Any combs containing drone comb should be placed by themselves and used only over an excluder as storage room, in order that the bees need not waste time and energy in raising drones.

I prevent swarming by the well-known plan of placing the brood above the excluder and letting the queen fill the lower chamber anew. I leave one comb, containing the least brood, below, and the queen keeps right on laying.

It is rarely necessary to place the brood above again. After the brood has been above the excluder for ten days it will all be sealed and will be fine for making increase. Here is something I have learned about making increase. It pays to make only a moderate amount and to make it early and strong. I think there should be a laying queen in every new colony from July 10 on, unless the colony is made proportionately stronger. For if a colony does not become strong by fall it will be weak in the spring and will not be ready for the clover harvest. Far better, then, to make only a moderate increase and make it strong.

If we have everything ready in the line of extra hive bodies, etc., we can simply add extra stories as the bees need room. I want enough hive bodies ready at the beginning of the season to hold the largest possible crop, for I don't extract until the whole crop is ready.

When we extract we must have everything arranged conveniently and the most uptodate tools to work with. There is a great deal of satisfaction in having everything go smoothly. I have used the steam uncapping knife two seasons and am well pleased with it. The secret of success seems to be to have plenty of steam so that the jet does not die down every time one gets into a comb.

I have also used the new friction drive power extractor two seasons with great satisfaction. It certainly sends the honey out of the combs. All of my combs are wired, so they can whirl at great speed without injury. A small gasoline engine furnishes the power. The same engine runs the saw in the winter and the cream separator and churn between times.

This past season I built a honey-house and workshop. It is 16x26, two stories high, with bee cellar under it. The upper story is used for storing supplies and the first floor for extracting honey, making hives, etc.

As the years go by, the stock of extracting combs grows larger and the crops of honey will be larger as a result, and swarming will be more easily controlled. The extracting combs are valuable and should be cared for.

We ought also to try to improve our bees each year by requeening with queens of better stock. If our

own bees do not satisfy us, we can send away for better queens. I have had bees all the way from blacks to the yellowest Italians, and am satisfied that the Italians are the bees for me. The only thing in which the blacks excel is in making more beautiful cappings to the honey, but that matters little to us who produce extracted honey

Let all who produce extracted honey make it their aim to have all colonies strong and overflowing with bees at the beginning of the clover harvest and the years of total failure will be fewer.

Elroy, Wis.

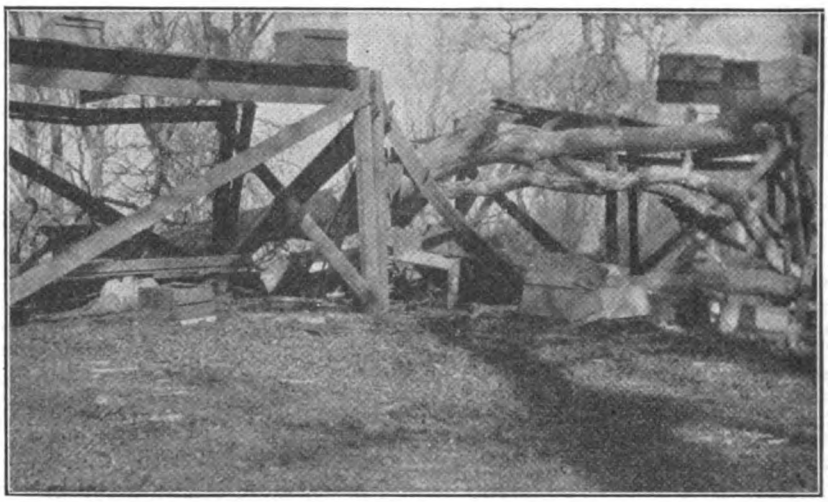
Carpet Grass

By C. D. Stuart

AN excellent pasturage for both live stock and honeybees is the carpet grass of our California river bottoms. Luther Burbank describes this plant as *Lippia Rcpens* to distinguish it from *Lippia Canescens* of European botanists. It is indigenous to Chili, and became first established in California as a lawn grass.

Out of some ten thousand plants grown, Burbank propagated two that he named Dixie and Mojave. Dixie makes a deep green lawn of good texture, and requires but one-tenth the moisture it takes to keep a bluegrass lawn healthy. Mojave grows a lighter green, but is valuable along canals and other water courses, since it throws out long roots that hold the banks from washing. Both varieties spread by rooting, like strawberry vines, and once introduced to a favorable locality, they quickly overrun the other grasses.

Lippia Repens, lawn plant in California much sought after by the bees.



A sycamore fell during a storm and broke the trestle on which the apiary is kept above the river floods. Photograph by Winfield Gear.

Lippia is a distinct relative of fragrant verbena, but different in physical habit. It is not hardy, and one objection as a lawn grass is that it turns muddy-brown as soon as frost strikes it. This unpleasant hue it retains all winter, and does not recover a lively green again until about the first of June. But where it roots on overflowed lands, it starts growth as soon as any of the other grasses, because, until the soil is drained of surplus water, no plant can thrive.

Lippia bears a small white flower, its nectar-sack easily penetrated by honeybees. The flow of nectar is abundant and steady, a yield of two cases to the colony not being extraordinary. The honey is light amber, heavy bodied, and about of the same quality as alfalfa, which it is usually taken for. It candies in about the same time after extracting that alfalfa honey candies. Two bottlers to whom I introduced it last year said they preferred the flavor of lippia to alfalfa, but they could not be induced to pay more for it.

The lippia flower attracts bees from far and near. In Chico, many lawns have been dug up because children playing on them in hot weather were invariably stung on their bare feet. The herbage is likewise attractive to live stock, whose bare feet are not so easily tickled by bee stings. Its fine leaves keep green and growing, independent of rainfall, and constant cropping serves to prune the runners and make the plants stool; while tramping makes them a solid mat. Burbank found that to run a wagon over the pasturage caused the plants not only to thicken, but to spread more rapidly than any other grass subject to a similar pressure. The accompanying photograph gives an excellent idea of the trailing habit of this grass, and of its blossoming.

In order to take advantage of carpet-grass pastures for honey producing, hives must be placed on trestles. The apiary from which the accompanying photograph was taken belongs to Winfield Gear, on the Sacramento river. The trestle is about 7 feet high, and in years of extreme inundation, water reaches within two feet of its floor. The floor accommodates about one hundred colonies, although at the time of taking the photograph there were less than fifty. These trestles are not expensive, and, when well built, last a lifetime—barring sycamore trees. Bees, when wintered on such elevations, are saved from mice, toads, skunks, and all like pests that disturb an apiarist's slumbers on stormy nights.

The photograph also shows some of the adverse conditions a river-bottom apiarist must expect to contend against. A neighboring sycamore tree nearly one hundred feet high fell during a storm last winter Mr. Gear was more interested, however, in the condition of the hive shown upside down than in the destruction of his handiwork. In this reversed hive the bees had started brood rearing weeks ahead of the other colonies, due probably to the breaking of combs and the spilling of their stores. The colony appeared but little incommoded by the topsy-turvy condition of their domicile.

Los Gatos, Calif.

Increase With Pound Packages

By John Vanden Berg

AFTER a number of years of beekeeping, the fall of 1914 found me with only five colonies of bees.

During the winter we nailed up a quantity of supplies, including 1,200 standard Langstroth frames, fitted with full sheets of light brood foundation, which was fastened in place with Dr. Miller splints. Wishing to make a good job we used eight splints that were boiled in beeswax to each frame.

Being anxious to increase the number of colonies as rapidly as possible, I bought up colonies of healthy bees wherever I could locate them, some being shipped in from another

State. Early in May I noticed the adult bees from one of the five colonies we wintered acting in a strange manner. From the symptoms I concluded it was a case of paralysis. They were treated in several ways without success; all other colonies were healthy.

We were now eagerly waiting for the pound packages of bees with queens which had been contracted for, and yet being short of empty combs and frames of honey, we were glad that they did not arrive, for at the time the weather was unfavorable, raining most every day. When they did come it was still raining. Taking them into the kitchen, I applied heavy syrup to the sides of the cages. After the bees had all the feed they could take they were put in a warm place until the next day, when we hoped for clear weather. I made ready ten hives at home, where the five colonies were, one of them having paralysis, there being at this time a large number of dead bees on the ground in front of the entrance of the affected colony. I opened this colony, found and killed the queen, then placed one frame of brood and bees from this colony in each of the prepared hives. A comb having little or no brood was given an extra supply of bees. A frame of foundation was placed each side of these combs. The cases were then opened and the bees shaken onto the bottom board and gently urged onto the comb of brood. When most of them had gone there the cage was placed on the bottom board to allow the remaining bees in it to join those on the comb. In one instance the greater part of the bees returned to the package. Later, before moving these hives to an outyard, they were given another frame of brood.

As the season advanced I failed to note any evil results due to giving these packages of bees combs of brood and bees from the colony having paralysis. Very likely a good warm feed and the introduction of a number of healthy young bees and a new queen would have helped matters in the diseased colony. Since there has not been any of this disease present lately, have not had the opportunity to try out the plan.

Other packages of bees were taken to the outyards as soon as received. They were given frames of brood, but no bees, since by now I was keeping the strong colonies busy drawing out foundation into combs for increase. Our main flow comes after August 15. We have no flow from clover here. After fruit bloom and locust blossoms are gone there usually is a little honey coming in from tulip trees during June. What honey we get at this time is very dark, but there is a good local demand for it. If this so-called "Black Strap Bug Juice" could be produced by the ton, New Jersey would become famous in the beekeeping world, I'm sure. At least I would be content to remain where at present located.

After tulip bloom there is a period of several days during which there is no surplus honey coming in. Early in July we sometimes enjoy a heavy flow from sumac, which usually lasts long enough to fill the brood chamber and complete the unfinished sections in the super. I now know it is a mistake to try to produce section honey here.

During this time we started some 3-frame nuclei, purchasing queens to head them. When sumac had gone there was no nectar coming in and none was expected until about August 15. In buying our supply of queens we purchased half dozen and dozen lots from different sources in order to try out many advertised strains. They certainly were full of energy. These bees did not waste time gluing up the hive fixtures, for, owing to a former experience, the bees were on staple-spaced frames; but, judging from the way they treated the frames of foundation and partly drawn combs they must have worked day and night trying to tear out the wooden splints; as a result, all the foundation and partly drawn combs that were in the hives were reduced to ribbons. I then gave the bees wired frames of foundation. I found that excellent combs could be gotten by placing these frames of foundation supported by splints into the brood chamber of strong colonies, one or two at a time, when the bees were gathering honey. When promptly drawn out, these combs are attached to the frames at all points, excepting perhaps a small space in the lower corners. The combs are practically perfect, brood being reared up close to the top bar, due to the absence of any sag in the foundation. If I were located where there was a good spring or summer flow I would try them again, but not as many as 1,200.

The 15th of August arrived, and I had bees in 80 hives, and soon after I realized that I would not have that many colonies, worthy the name, ready for the fall flow. I promptly killed a number of undesirable queens and when the work of uniting had been finished I had 60 colonies. They all gathered sufficient stores for winter, a few gave 25 to 30 pounds of extracted honey from aster. We prepared them for winter by wrapping in tar paper. The entrances were contracted down to ¼x 6 inches.

Wanawah, N. J.

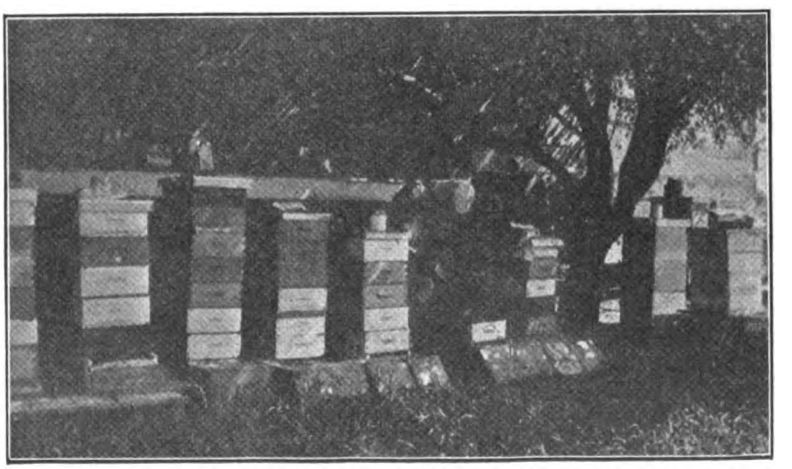
Care of Virgin Queens

By C. C. Miller

A CORRESPONDENT writes: "Could you not give some advice in the American Bee Journal as to how virgins should be handled from the hatching-cage to egg-laying? This period is the sticker. Everybody tells how to rear them, which is easy; but to get them accepted, mated and laying is, indeed, another game."

There is probably no one, however experienced, who can count each year on having successful layers out of 100 per cent of the young queens which emerge from their cells, and nothing can be said here in the way of teaching that would warrant any such expectation.

If a sealed cell be given to a nucleus which is queenless, and fully conscious of its queenlessness, which is as much as to say that it has been queenless 24 hours or more, there should be little doubt as to kindly acceptance. But if a virgin be given from a hatching-cage, as our correspondent mentions, the case may be different. If a virgin be taken just as soon as she emerges from her cell, supposing that she has not been imprisoned by the bees some time after she is ready to emerge, nothing is more sure of acceptance. But if she be left in the cage until a week old, her chances of life are slim, no matter where introduced. While very young, supposing she is mature enough to emerge from the cell without being picked out, the bees seem indifferent to her, not considering her in the light of a queen, but as an innocent young thing that is utterly harmless, and she will be tolerated even in a colony having a good laying queen with which the bees are perfectly satisfied. But when she becomes old enough, and begins to put on airs as one of royal blood, then she is considered in quite a different light. If it be in a colony with a laying queen, even though she has been kindly treated in her babyhood, just as soon as she begins to put on



C. B. Palmer's apiary in summer. Sweet clover helped make a big yield.

airs as a young lady of royal birth, there seems to be fear for the safety of the reigning sovereign, and the intruder is assassinated.

In a queenless nucleus, one would think that a virgin of any age would be kindly received, yet if she be past a certain age the bees seem to think there is something not satisfactory about her, and she is very likely to be voted out. So if a virgin be given from a cage or a nursery, care should be taken that she be not over the age prescribed in the laws of the bee commonwealth. Just what that age is, perhaps no one knows yet, but it may be well to advise that to be on the safe side a virgin should not be left in a nursery until she is more than 24 hours old. Of course, it is convenient in many cases to leave her unused until a week old or more, but one runs risks in so doing.

The age of the bees in a nucleus is a matter of importance. In general it is the older bees that are grouchy about accepting a queen, whether the queen be laying or virgin. So it is better to have a force of **young** bees in a nucleus. This matter will be likely to take care of itself when a nucleus is first formed, for the older bees are likely to return to their old place. An extra allowance of bees should be given to make sure the nucleus will not be too depleted by the return of these older bees. If the nucleus is to be used for the fertilization of more than one young queen, keeping it stocked with sealed brood will provide for a continuous supply of young bees.

Perhaps the most ticklish time for the young queen is when she makes her nuptial flight. What with birds and insect enemies, many a virgin makes her flight, never to return. Worst of all is bad weather, with its usually attendant lack of nectar in the fields. One may atone to some extent for the lack of incoming nectar by daily feeding, although it is doubtful if any feeding can entirely take the place of a natural flow. But against the baneful effect of bad weather there is no remedy. The most experienced veteran is just as helpless against it as the novice. All that can be done is to grin and bear it, hoping for better luck next time.

The man who rears queens merely for his own use will time it so as to rear them mostly, or entirely, during a good flow, when weather is likely to be favorable, rearing a superfluity of virgins, so that if a goodly portion be lost he will still have enough successes to meet all his needs.

(Dr. Miller refers the above to the editor with the request to add to it if advisable, as he feels "none too competent." It may be as well to say that this matter of virgin introduction has always proven a difficult matter for us, and we much prefer the introduction of ripe queen-cells. We will be glad to hear from men who have been regularly successful in the introduction of hundreds of virgin queens. They are certainly not very numerous.—Editor.)

What Do You Consider the Most Equitable Arrangement for Working Bees on Shares?

By L. B. Lundie

I HAVE had a little experience with working bees on shares. Some years ago, in addition to my own work, I managed an apiary of about 60 hives for the honey and wax. The owner was a thorough gentleman. He never interfered with me at all for the whole season and was quite prepared to take my word for what honey and wax was gathered for the whole season. However, I only managed the bees for that one season, as I did not consider it paid.

I also had another experience three years ago in working bees on shares for half the honey and wax. An old employee of mine was leaving for the front and was much concerned about the seven hives he was leaving behind. In a weak moment, or in a burst of patriotism, I told him not to worry about his bees, as I would do my best to look after them during his absence. One season, though, was quite enough for me looking after those seven hives. They all wanted to swarm, and the little apiary was easily doubled, making 14 hives in all. I apologized to the boys' parents and regretted that I was unable to look after them further. The coming season is the fourth since he went away, and, with proper management, there should have been upwards of 50 hives to have started the season with.

In each case, Mr. Editor, I was dissatisfied to continue, as I considered half the honey and wax was not sufficient. Of course, in letting bees out on shares much would depend on the apiarist. To an incompetent man or a stranger, or one who has had little experience, a half share might be ample, and, perhaps, if he should neglect his work in any way, too liberal payment. But I am of the opinion if a man is found to be thoroughly honest and also has a thorough knowledge of his work, and, withal, is not afraid to work, he should be entitled to more than half the honey and wax. Especially if there is no need for the owner to visit the apiary from one year's end to the other.

I fail to see why bee farmers should be treated differently and get a smaller share than wheat farming on the share system. Before the war there was much of this done in this locality. The worker doing all the labor, such as plowing, harrowing, etc., and finding two-thirds of the seed and manure, and receiving for his reward two-thirds of the crop. The owner of the land contributing one-third of the seed and manure, and being quite content with a third of the harvest. Many may probably say that the conditions are so totally different. In some respects I agree with them. But in working bees on the share system the owner should not close his eyes to two outstanding features. (1) Nature, providing you are near a State forest, gives you the nectar free, gratis and for nothing; and (2) as I have previously mentioned, so much depends on the personal touch and the honesty of the beekeeper.

Before closing, another point is really worth mentioning. At the present time the majority of us, to a greater or less degree, are thinking of investing in the seventh War Loan, and will receive 5 per cent for money invested. I estimate the value of 100 hives with plant and accessories at say £200. If the country is any good at all, it should average, year in and year out, at least two tins to the hive, and with the ruling high price of honey, after paying for tins and cost of range area the net proceeds of the apiary should amount to £200 (on an average) every year. The owner receiving one-third share should get £66 13s 6d, and the beekeeper, doing all the labor, gets the balance, £133 6s 8d. Allowing 10 per cent off for depreciation, say £20, leaving £46 13s 4d net profit, which is over 20 per cent on the capital invested. Providing the right man is

Honey house and apiary of C. B. Palmer, at Bradshaw, Neb. Nebraska is to have a meeting of beekeepers in January.

looking after the bees, a gilt-edged security, is it not?

I might add, unless otherwise arranged, the swarms and increase should be retained by the owner.

From Australasian Beekeeper.

Montana Sweet Clover and Cherries

If you are coming to the Glacier National Park next summer, be sure to come in July, when those big black, sweet cherries are ripe. This is not a good picture, for it does not show the trunk. We are 31 miles from the Glacier National Park.

With the yellow sweet clover they are planting, this will soon be a fine honey country and the honey is fine. I use a large hive. I want lots of room in the lower story. We never take any honey from the lower story, but I have many times taken off as much as 200 pounds of honey.

J. D. KAUFMAN, Kalispell, Mont.
Cloverdale Stock Farm.

An Unusual Season

By G. C. Greiner

THE past season has been, in many respects, an unusual one. Almost every season presents some extremes in one direction or another, but it does not often happen that so many extremes follow one another the same season; it can be justly termed "a season of extremes."

When spring opened many beekeepers found themselves destitute of their bees. According to different localities, severe climatic conditions, the ravages of disease, etc., their losses ran anywhere from 10 to 80 and 90 per cent. A few reported hardly any winter losses, while others had lost nearly or quite all they had. The writer was one of the latter class, having been visited by American foulbrood in its most destructive form. To make up the deficiency by buying from neighboring bee-owners was out of the question. Only in exceptional cases could bees be bought, and then only in limited number, as an accommodation. All felt eager to keep what bees they had and comply with Mr. Wilson's war-time recommendations to produce as much foodstuff as possible for the boys "over there." Even the combless package establishments could not better the situation to any great extent; they all reported being overrun with orders, more than they could fill for a long time to come.

Mr. J. D. Kaufman, Kalispell, Montana, eating sweet cherries in the tree. He lives less than 60 miles from the north line of the United States.

Then the season's honeyflows presented some peculiar features. The first sources of nectar, among which the dandelion played an important part, was exceptionally helpful to the building up of our bees. I have never known a season in which medium and even weak swarms made such rapid progress. Although the white clover yielded abundantly, on account of unfavorable atmospheric conditions, the first half of the flow was entirely lost to the comb-honey producing colonies; they did not enter their sections until the best part of the flow had passed. Fortunately, the main part of our bees were run for extracted honey, which enabled them to store surplus at open spells, when the comb-honey colonies could not build comb or even draw out foundation.

In spite of the discouraging beginning, the season turned out to be one of the best in many years, the most bountiful surplus crop was secured. From the time the first honey from early fruit trees was gathered, honey never ceased to be coming in until bees were confined to their hives by cold weather in October. During all my extracting early and late honey, I could leave the doors of my honey-house wide open and not a bee offered to molest me. Favored by this unusual honey-flow, I have taken approximately 280 pounds of surplus honey per colony, spring count; of this about one-third was comb honey.

Then came another extreme in the shape of unheard-of prices for our product. For many years I have sold the very finest of water-white clover honey for 40 cents per quart and a little later for 45 cents. Then came the beginning of war prices, a year ago last summer, with 65 cents per quart. This caused some of our close figuring customers to drop honey from their daily diet and it seemed at that time as though this higher price would have a detrimental effect on the sales of honey. But this was only temporary; it could not reasonably be expected that the price of honey would remain on a level with prewar prices, when all other commodities had taken a steady upward course, reaching, in many instances, double and treble their former prices.

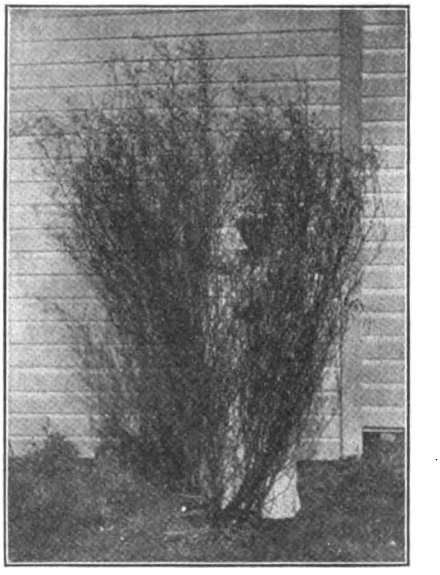
But the war continued, and to supply the hundreds of thousands of our boys at the front, as well as needy foreign nations with food, a general saving of all provisions was ordered by the President. The sale of sugar was especially restricted, so that the people were compelled to fall back on honey as a substitute for sweetening. This gave the price of honey another advance in all markets; the last year's 65 cents was raised to $1.00 a quart, with smaller packages still higher in proportion. Although beekeepers, as a class, are generally law-abiding citizens and regretted these deplorable war-time conditions, yet, unintentionally they were benefited by the increase expenses imposed upon others. In many instances they more than made up their previous winter losses by these high prices of honey.

The last extreme which I wish to mention in this article is the product in honey and increase of my best yielder. Ordinarily my average yield mentioned above would pass as an extreme, but this colony has more than doubled it. To make everything as plain as possible, I can do no better than give a condensed outline of the main features connected with this case.

When I purchased this colony, early this spring, they were, in regard to brood and bees hardly above medium strength, but their brood was, to all appearances, perfectly healthy, which under the prevailing circumstances, I prized higher than a hive crowded with bees. It was somewhat of a disappointment to me that they had all indications of being genuine hybrids, which they proved later by their stinging inclination.

As the season advanced and new honey made its appearance they built up at an astonishing rate, so that by May 10 their hive was crowded with brood and bees. According to my practiced rules and regulations, I divided them on that day by leaving the queen with two combs of brood and all adhering bees in the old stand and moving the remainder, after introducing a young southern-bred queen to a new one some distance away.

Making this division seemed to inspire the old queen with new energy in building up her reduced home, and by June 2 the hive was again full of brood and bees. Being anxious to make all the increase consistently, not cutting off the honey crop entirely, I divided them a second time exactly as the first time, except that



One stock of yellow sweet clover grown in northern Montana. Note the woman behind it. In America the prudent farmer has and will leave to posterity, a fertile farm.—J. D. Kaufman.

this second division was run for extracted, while the first was used for comb honey.

On July 12 something unexpected and unusual happened. The first division, after they had finished two supers of twenty-four 1-pound sections each and were nicely at work in their third, cast a medium-sized normal swarm. I generally return such to their old home or hive them on the old stand, but being still anxious for increase, I hived them separately on six empty combs, and a few days later gave them an extracting super reduced like the hive by chaff division-boards to five combs.

Now for the result. I did not actually weigh the honey from any of these swarms separately, but I have time and again weighed supers before and after extracting. I can, therefore, vouch for the approximate corectness of my estimates. From the original queen, hybrid as she was, I have extracted approximately 225 pounds; the first division has given me 120 sections, the second division 210 pounds, and the young swarm 55 pounds, making a total of 610 pounds from one colony, spring count. This breaks all records of my beekeeping life.

The secret of my heavy yields, expressed in a nutshell, is simply this: Brood-chambers should never be disturbed during a honey flow. I never open a hive from the time spring management is completed until the following spring unless it is strictly necessary.

La Salle, N. Y.

The Tools of a Worker Bee

By D. M. Macdonald

IT was my pleasure and privilege lately to visit a pneumatic tool factory, large engineering works, and also a part of a ship-building yard. The tools being manufactured and the tools being used were marvels of perfection and admirably fitted as means to an end. Yet both in finish and application they were left far behind by the exquisite tools possessed by the worker bee, as seen with the aid of the microscope; and I should like, if I could induce our budding beekeepers to give of their spare time to study the marvelous pieces of perfection included in a bee's outfit.

Pollen Baskets. These are models, and every part is exactly suited for the purpose for which it was created. First, we have a hollow space near the joint of the posterior leg, and facing this are a great number of bristly hairs to save the cargo from falling out of the baskets. On her fore legs are brushes with which she dusts the feathery hairs on her abdomen, pressing the pollen grains with which they are coated, backwards into the baskets, where the mass is pressed down in a solid load. The in-curved hairs keep this in position while she is winging her way to the hive. Her burden is unloaded with the assistance of her other legs and the pollen deposited in the cells ready to supply beebread for the nurse bees to feed the larvæ. Every tool aids the good work, for it takes several to load up and several to unload the comparatively huge burden

Antennae. These feelers are organs of touch and bear 12,000 tactile hairs. They are also supposed to be organs of smell, and in the case of the drone, contains 37,800 smell hollows. (This has recently been disputed.) Besides, many claim that they are the seat of some unknown sense or senses, whereby the worker bees fathom and measure the darkness of the hive interior. As organs of touch note how the guards employ them to spy strangers. With bees of the same hive they are used to caress and fondle. Touching the queen they display affection and adoration. In her absence they employ them to discover what is wrong, and by a mutual contact of the antennae they discuss how to right the wrong by providing a new mother.

In the process of comb building what an infinity of shapes the antennae assume, and to what a multitude of uses they are put. They are the true architect's and builder's main stay. They are the tape, ruler, plumb-line, compass, square and cube, all rolled into one, which jointly and severally enable the workers to construct that wonder of perfection, the hexagonal cell. Here is a marvel: deprived of the antennae the worker ceases to take any delight in labor of any kind.

Such a delicate and important tool requires to be kept clean and fresh, and here, fitted for the occasion, we find a specially provided appliance suited for the purpose:

The Curry-comb. The bees' anterior lower legs are found to perform duties so analogous to what are carried out by our hands that they are called palmae. They "wash" the bee's face, but their chief use is to clean up the antennae. An open space between two joints of this leg just permits these being drawn through, with a slight pressure applied by the sinews, and the curry-comb, consisting of a number of hairs, cleans and polishes this important organ. The process can be often observed and the action of the pecten is very interesting.

The Feet of the bee are fitted with two tools well worthy of study; the claws and the pulvillus, pad or cushion. The claws aid the bees in walking over a rough and uneven surface. By digging these into the hollows of depressions, they are enabled to make progress with comfort and freedom. When, however, the surface is smooth as glass the pad comes into play, the claws are pushed back and the cushion exposed, thus preventing the insect from slipping, as one would do on smooth ice, because the pulvillus is provided with a kind of gum which this apparatus can exude at the will of the insect. When walking on the inner ceiling or similar parts of the hive this appliance enables the bee to walk upside down with equal facility as she walks or runs in her ordinary position. The claws act as a set of hooks when bees are clustering, while out as a swarm. Those below hook onto those above. The same ingenious contrivance permits the bees to hang in festoons when comb building, and thereby provide the workers with a set of ladders, bridges and roadways along which they move with dexterity and facility.

The Tongue. The honeybee is provided with a wonderfully complete tongue, made up of many parts, but it is difficult to explain briefly how all the tools are made to work together at the will of the worker bee when collecting nectar. Let it suffice at present that she can, by manipulating these parts, gather either the tiniest sip or a copious flow at will. The muscles force this liquid into the honey sac, where it undergoes a purifying process before being regurgitated into the cells. By a powerful set of muscles it is forced out of the sac, but in the act it is strained. The strainer consists of a set of hairs pointing backward and inter-crossing, which hinder the pollen grains from finding their way out into the honey-cells. There are quite a number of tools employed in providing us with pure honey. Amongst others not yet named is a gland in the mouth which aids in making nursing food for the young bees, and royal jelly for the young queens.

Bees are provided with a species of laboratory wherein they convert the liquid honey, which they pass into a "tank," and out of this they manufacture those sheets of wax which we find at times in the wax pockets. Parts of their feet, their claws, as well as their mandibles, are used as tools for passing on these sheets to the mouth, for masticating and making them pliable and malleable for biting them into shape, and for building them into the waxen cells. They are also used for capping brood and honey-cells, and the mandibles are used by workers, drones and queens in biting their way out of their natal cradles.

The Sting of the bee is a tool frequently felt as well as seen. It is her sword or bayonet, her scimiter, a lance, her weapon of offense and defense, wherewith she gallantly defends her hearth and home, frequently to the sacrifice of her own life.

Bees have frequently to force their way into the corolla of a flower when hunting for both pollen and nectar. In the same way their multifarious duties in the hive demand that they enter the confined space of a worker-cell. Therefore they are fitted with four small wings, capable of being folded into small dimensions. To increase their powers of flight they are provided with a set of hooks whereby they can fix each pair of wings into one large one, thus greatly magnifying not only their powers of flight but adding to their carrying abilities.

Seen through the microscope, these various tools are wonders of perfection, and I earnestly advise all beekeepers to make a careful study of their mechanism and functions.

Banff, Scotland.

Painting the Queens to Recognize Them

So many have asked me questions concerning my way of marking the queens that I will give you my method of proceeding.

The coloring may be prepared of several tints, but yellow is the most useful, as it is more readily seen and helps in finding the queen. I buy in a paint shop a few cents' worth of chrome yellow. I soak it with a little alcohol to make a thick paste, which I then dilute with sulphuric ether until it becomes liquid. It is then ready to be employed, but must be kept meanwhile in a well closed vial.

To hold the queen during the operation I use a ring made of pasteboard with a few threads run back and forth through it in all directions about an eighth of an inch apart, like a net. Some apiarists prefer to hold the queen by the thorax or drop the paint on her while she is freely walking about. But there is more or less danger of spotting her on the wrong place, on the head or the wings. I prefer the net.

I place the net over the queen on a piece of comb and press down lightly so as to hold her down, then with a simple blade of grass I drop a small particle of color on her back. She must not be allowed to stir under the net as the color might spread. I prefer to release her at once. In a few seconds the color is dry and the queen remains marked for her entire life. It is important that the paint be of the right consistency, neither too thin nor too thick. In the first case it might spread and soil her. In the second it would not remain fast to the thorax. A beginner might experiment first on a few worker-bees, so as to become acquainted with the method and the necessary dose.

I usually mark my queens in this way before they are mated, as it is the most favorable time, and I introduce them at once into mating nuclei. But if I were to deal with fertile queens in full colonies, I would cage them for a half day, as the odor of ether might cause the bees to ball them.

FERN. STOCKLI, Switzerland.
(Bulletin D'Apiculture).

(On page 200 of our June, 1914, Journal, Dr. Brunnich gave his method, which is very similar to the above. Dr. Brunnich uses lacquer, with white, red, yellow or green, changing the color each year, so that he knows at sight how old a queen is. Every 4 years the same color comes again. He also makes one, two or three points, or a longitudinal bar, on the corslet, as recognition marks. He says it is very important to be able to know, at a glance, the age of a queen. We can testify to the fact that such markings make the queens exceedingly conspicuous, when hunting for them.—Editor.)

Heating Honey as it Comes From the Extractor

The Collier Brothers, at Goliad, Texas, have an ingenious plan for heating their honey as it comes from the extractor. The picture gives a good idea of the heater, which is outside the building. A honey tank is set on top of a small furnace used for the firepot. Two pipes can be seen between the tank and the honey house. The honey runs from the honey house into the tank through the upper pipe and is returned to the building from the lower one. It is then strained while warm. In the October, 1917, issue of this journal is an account of the method of preparing honey for market practiced by N. E. France, of Wisconsin. Mr. France also heats his honey soon after extracting, finding that there is less trouble from granulation where the honey is heated at once.

Honey heater used by Collier Bros., Goliad, Texas.

The Sense of Direction

Most of our readers are aware of the attribution of a sixth sense to the honeybee—the sense of direction—by some scientists. On this subject we find the following in the "Bulletin Suisse," which they have borrowed from the "Echo des Alpes." It was written by Professor Emile Jung, of the Universite de Geneve.

"In order to inform myself upon the discussion, I renewed, a few years ago, upon our common honeybee, the experiments of Fabre. I placed a few in a paper bag, after having marked them so as to recognize them; then I carried them to several distances from their hive. I liberated them at one kilometer (.62 mile). They came back home regularly. At 3 kilometers a small number remained away, and as the distance was increased the number of the lost increased. Beyond 12 kilometers, none returned. It is evident that the "topographic sense" of bees is suited only to small distances; it therefore loses its mysterious character, and I explain it in a different way from Fabre's view.

"While they are working in the fields it is certain that bees make observations, as we do ourselves in our rambles. They note here a tree, there a stream, in another spot some peculiar grass; they thus become acquainted with the country they inhabit, the immediate environs of their home first, and later more distant spots. The older ones, having traveled much, have doubtless in their memory a number of guiding marks which enable them to always know just where they are and the shortest line home. The younger ones, or those newly brought to the region, who have not yet had time to make numerous notes, will get lost easily, for the same reason that we are easily lost in a strange city. Their experience does not guide them farther than a few hundred meters from their home; they are quickly confused, and that is why few of them return.

"The following experience confirms this opinion: I took, at the entrance of a hive situated near the Lake (Leman), 20 bees, which I marked and which I enclosed in a box. Taking them to the distance of six kilometers 3.9 miles), I turned them out in the middle of a meadow. Seventeen of them returned to the hive, some immediately, others as late as an hour afterwards. Three were entirely lost. The next day I again placed in a box the 17 bees which had thus found their way through the fields and meadows, but this time I carried them in a boat 3 kilometers out in the lake. They flew in different directions and finally disappeared. What became of them? No one knows, for they never returned home. The famous "topographic sense," with which some writers have endowed the bees, as they have done with ants, completely vanished in this experiment. Doubtless their ramblings had often led them to the meadow to which I had taken them the previous day; since 17 out of 20

found their way back. But on the lake, where there is nothing for them to find, and where, therefore, they had never wandered, the ill-fated insects, finding no guiding marks, no sign-post, to direct them in the proper direction, being left entirely to luck, were all lost, without exception.

"These experiments were not the only ones that I made upon the bees of our region, but all gave similar results."

We may add to this information that it is not necessary that the bees should have traveled the entire distance from which they are released, in order to find their way home. In seeking their way back they probably go in all directions until they recognize some familiar features of the country.

Releasing Bees From Packages

We have received some enquiry from readers regarding the manner in which bees are released from packages. In this connection we have been reminded that we failed to explain fully the picture on page 372 of our November number, where O. J. Jones is shown releasing the bees from a package.

The hive is made ready by removing four or five of the frames from the hive in which the bees are to be placed. The package is opened and the cage containing the queen is removed. If the queen is all right her cage is then placed between two of the combs, giving the bees opportunity to release her. The opened package of bees is then placed in the space left vacant by removing the frames and the cover placed on the hive. The bees will shortly leave the package and cluster on the combs. Where the bees are shaken from the package they sometimes take flight without marking the location, and a part of them become lost. Where released as above described there is little danger of losing the bees and no undue excitement.

Large Hives Again

With great interest I read your article "Advantages of Large Hives." Although it is not the usual custom to have hives of different size in the apiary, I use the 10-frame Langstroth, I wish to introduce some of the so-called Jumbo or Dadant-Root hives and some shallow supers.

1. Can you use regular Langstroth 10-frame bottoms and covers for the Jumbo hives, or are yours wider on account of the 1½-inch spacing?

2. As you prefer 1½-inch spacing, do you use only 9 frames and a dummy, or are the 10-frame hives for this reason a little wider?

3. How high are your shallow supers? Are they higher than the regular shallow supers for dovetailed hives, and could two of those supers, one on top of the other, be used for the regular Jumbo frames?

Wisconsin.

Answer—If you wish to use the Jumbo hive, 10-frame, with 1½-inch spacing, it will be necessary to use wider bottoms.

You can use the Jumbo hive with the same bottom as the ordinary 10-frame Langstroth, by using only 9 frames in a 10-frame hive. The Root make of hives are 14⅝ wide inside. The Lewis make are 14¼. If you use 9 frames spaced 1½ inches, you will have, in the first case 1⅛ inches and in the second case ¾ inch of room for a dummy. This dummy may be used on the cold side of the hive, i. e., the side which is exposed to high winds, usually west or north.

As we use the regular Dadant hive, we have not had opportunity to try the Jumbo, so have not had to solve this question in our practice. But we would recommend that you use the 9 frames and a dummy, if you do not wish to have bottoms of different sizes in your apiary.

This answers your first two questions. Regarding the third, we make our shallow supers, as stated on page 369 of the November issue, with a depth of 6⅝ inches, in the clear, so that the side bar of the frame is exactly 6 inches deep. This was the suggestion of Mr. Langstroth, years ago, when we began to use the extractor. You might make a super which would enable you to use two in place of a hive body. But we do not advise this. We have never seen the need of using shallow frames in deep bodies and have always kept the brood chambers and extracting supers as separate and distinct institutions. We have never regretted it.

Allow us to say that we have never urged anyone to change from the Langstroth to the Jumbo, simply because we do not know whether our friends feel willing to stand the greater expense of large hives. The matter has been discussed because several requests were made for our views and because the matter was mentioned in Gleanings. But we are very free to say that, personally, we prefer the large hives we use, known as Dadant hives, to any other style. Our experience with these hives is now of nearly 50 years, and as time passes we like them better and better.

The cheapest way, however, to make the change from shallow to deep hives is evidently through the use of the Jumbo, in the manner mentioned above.—C. P. D.

BEE-KEEPING FOR WOMEN

Conducted by Miss Emma M. Wilson, Marengo, Ill.

Large Hives and Women Beekeepers

Nowadays the 8-frame hive is getting a black eye from all quarters, and seems to have no friends. It may be a little hazardous to say anything in its favor, but it has one advantage that cannot be denied, an advantage that appeals strongly to women. That is its lightness and the ease with which it can be carried as compared with heavier hives. This counts strongly where hives are carried into the cellar for wintering, and still more strongly where they are taken to outapiaries and brought back home in the fall for cellaring. To be sure, some strong man may be had to do the lifting at these times, even if it be some neighbor a mile away, but it frequently happens throughout the season that it is needed to move a hive from one place in the apiary to another, and at such times it is not the most convenient thing to call on a neighbor a mile away.

In the American Bee Journal for November occurs an interesting and instructive article by our editor upon the advantages of large hives. As might be expected from a man who is the soul of fairness, the merits and demerits of large and small hives are very fairly discussed, except in one particular, and that evidently from a misunderstanding. On page 369 occurs this: "The addition of a full story to a middling colony gives too much space above, in spring, when the weather is still cool, as it doubles the capacity of the hive at one stroke. The addition of this full story to a populous colony which is overflowing its brood-chamber, entices the queen away from the lower story, if the lower story is not sufficient for her laying capacity." Clearly the misunderstanding is that the extra story is added above. But among those who use 8-frame hives and add a second story in spring to give the queen more room, is it the general custom to give that room above, or below? What the custom is in this locality may bee seen from the following extract from "Fifty Years Among the Bees," page 105:

"When the colony is beginning to be crowded and there are no colonies needing help, and sometimes even when others do need help, a second story is given. This second story is given below. Putting an empty story below does not cool off the bees like putting one above. The bees can move down as fast as they need the room. Indeed, this second story is often given long before it is needed, and sometimes two empty stories are given, for it is a nice thing to have the combs in the care of the bees. They will be kept free from moths, and if any are moldy they will be nicely cleaned out ready for use when wanted.

"Sometimes when a colony is very strong and a story of empty combs is given below, a frame of brood is taken from the upper story and put below, an empty comb being put in its place above. But unless the colony is very strong, this hinders

rather than helps the building up."

This was the invariable plan of procedure, except in the year 1914, when all colonies were unusually strong by the middle of May, and then supers of combs were given above, not because it was the better way, but because it was easier for the beekeeper.

Whatever objection there might be to giving an empty story above early in the season, that objection does not at all apply when the empty story is given below. Instead of making an empty space for the bees to keep warm, the brood-nest is really warmer for having the empty story under it. The bees are not forced to make a start several inches away from the brood-nest, but are allowed to extend the brood-nest downward in a natural manner, extending it just as little or as much as to them seems good. Right here will occur to some the objection that bees would be loth to extend the brood-nest across two pieces of wood and an empty space. There seemed little evidence of this, although no doubt a continuous comb would be at least a little better.

A little thinking will show anyone that this two-story plan with 8-frame hives allows the bees to follow their inclination to keep their brood-nest in a sphere much better than they can do it in a single-story 10-frame hive. Like enough the Dadant hive, with its big frames, is better still in this respect, for in this hive the bees do not have to keep warm the space taken up by the bottom-bar above and the top-bar below. Yet if it should be thought that this space is any great hindrance to having both stories occupied by the queen, a paragraph on the page following the one already quoted is in point:

"I may say here that after a good deal of experience with colonies having two stories, I find that there is no trouble from having the queen stay exclusively in one or other of the stories. She passes up and down freely, keeping filled with brood in both stories as many combs as the bees will care for."

Dr. Miller says if he were beginning again he would have something larger than the 8-frame hive. In this view the woman in the case, the one who has been his helper these many years, does not concur. His objection that the small hive requires too close attention to avoid starving in winter is, in her opinion, overbalanced by the convenience and lightness of the smaller hive, and especially of the lighter supers. Of course, those women who are not willing to give the extra attention required by the smaller hives should use the larger or let bees alone.

(I acknowledge the oversight and readily agree that small hives are much more convenient for the ladies. —C. P. D.)

Shirley V. Johennig finding the queen. Though less than 8 years old, she has no fear of bees, and is expert enough beekeeper that she can detect workers, drones, and the queen. The hive above is only 20 feet from the back porch. Mrs. O. B. Johennig, Richmond, Va

Punic Bees

What is said by Ph. J. Baldensperger, page 375, about Punics, recalls our own experience with them. Some years ago, at the time when much was being said about Punic bees, John Hewitt sent to Marengo two Punic virgins. Of course, their worker progeny were hybrids, and we had only these to judge from. The most outstanding characteristic of these bees upon being first seen is one not mentioned in Mr. Hewitt's assertions, nor in Mr. Baldensperger's notes upon them. That characteristic is their blackness. They are black, with a blackness beyond any other bees.

According to our experiences, Mr. Hewitt is not far out of the way in claiming that they are good workers.

They are very cross, smoke seeming to have little effect upon them.

As to building sections, our experience tallied with Mr. Baldensperger's: Their sections were so watery as to make them utterly unfit for section work.

Their excessive propolizing was decidedly objectionable.

In considering the items here given it must be remembered that not pure Punics, but hybrids, are under consideration. On the whole, we did not consider it desirable to continue them after the first generation.

The Iowa Convention

The seventh convention of the Iowa Beekeepers' Association was held at Des Moines on November 6 and 7. Although the attendance was reduced somewhat by the epidemic of influenza, the convention was quite successful. Mr. Morley Pettit, of Georgetown, Ontario, who was formerly the Provincial Apiarist, was present and spoke at two of the sessions. Mr. Pettit had some very good moving pictures showing practical beekeeping; he also used a considerable number of lantern slides in illustrating his lectures. Dr. Phillips and Dr. Demuth, of the U. S. Department at Washington, were present and gave practical addresses. The program was excellent from start to finish.

In accordance with the policy of the Association, which has been to change officers frequently, a new board of officers was elected, as follows:

President—A. F. Bonney, Buck Grove, Iowa.

Vice President—, Hamlin B. Miller, Marshalltown.

Secretary-Treasurer—Prof. F. Eric Millen.

Directors—Edward G. Brown, Sargeant Bluff; F. H. Stacey, Iowa Falls; L. W. Elmore, Fairfield.

A Sign of the Times

We are again in receipt of Russian bee magazines. We have just received one from Kazan, a city of 175,000, on the Volga, about 450 miles east of Moscow. Does anybody doubt that Russia is going to come out of her trials with new ideas and progress? All that the Russian people need is a chance to govern themselves under democratic ideas.

Peace or War—Which?

Cross Bees! Crooked combs in ill-managed hives. When we attempt to take out honey, it leaks out in every direction. The bees become excited. The workers become robbers. Stings everywhere. War!

Gentle bees! Good hives, straight combs! No leakage! No robbers! No strife! No stinging! Peace!

Peace, sweet peace Is it so very difficult to secure it? Let us resolve that we will have only gentle bees, well-made hives, no crooked combs, no leaking honey, no robbers! Peace and plenty! A land flowing with milk and honey.

Kansas Meeting

The Kansas State Beekeepers will meet at Topeka January 7 and 8. A large attendance is expected. For particulars concerning the meeting, address O. A. Keene, Sec., 1600 Seward Ave., Topeka

Pennsylvania Beekeepers' Meeting

The next annual meeting of the Pennsylvania Beekeepers' Association will be held in Harrisburg January 21, 22, 23 and 24, in connection with the midwinter Agricultural Show.

A number of interesting addresses

have been promised. For information and particulars, address the Secretary, H. C. Klinger, Liverpool, Pa.

Switzerland

A letter from the editor of the Swiss Bulletin de la Societe Romande:

October 25, 1918.

Dear Mr. Dadant: I have your note. I am glad that you find something of interest in our little magazine.

You say that your crop is short. I am sorry to hear that, for sales are quick and, if you could export, there would be a great profit, as I believe the price is still higher in France than in Switzerland.

In most of Switzerland the crop was fine, such, in fact, that we have to look back a number of years to find one like it. The first fortnight of July was favorable, during 12 to 14 days giving crops of 10 to 12 pounds per day, and even as far as 22 pounds in a single day. It is honeydew, but of good quality, though very dark. It sells as readily as fine spring honey, at 57 cents per pound, retail and 48 to 49 cents wholesale.

The war situation is favorable, thanks to the formidable help of your country. The Boches are "letting go" and everyone says "thanks to the United States." Your country is now writing one of the finest pages of history.

Beekeeping is getting a new and considerable elan and our little magazine has an increase of a thousand subscribers. We are just now making an investigation, through the presidents of the association branches, concerning the value of honey as an "anti-flu" food. It has been ascertained that beekeepers are generally immune. Just how correct this is we hope to find out.

Cordial and respectful salutations,

SCHUMACHER.

(The honeydew of Switzerland must certainly be better in quality than what we harvest in this country. We have yet to find honeydew that could bring more than half the price of fine clover honey.—Editor.)

Nebraska Meeting

The Nebraska Honey Producers' Association will hold their annual meeting on Wednesday, January 22, at the University State Farm at Lincoln, Nebr., and have arranged a very full program for the day.

In the morning session Mr. F. C. Pellett, of the American Bee Journal, will give an illustrated talk on "Honey Production as a Business." This will start at 9 o'clock. Another thing in the morning will be a discussion on county organization. This will be led by F. G. Maxwell, of Douglas county, who is secretary of that branch. The Douglas county branch is becoming a very live organization. It has already sent in an order for supplies for members and sent a committee to the extension service of the State asking for aid in getting an extension man for this State, and prospects are becoming brighter every day for such help.

The afternoon session will begin with the business meeting, a new constitution will come up for adoption and everyone who takes interest in the honey business should be present and see that everything is done right.

After the business meeting Professor F. Eric Millen, the State Apiarist from Iowa, will give a talk on "Beekeeping and Beekeepers, as Seen by a Bee Inspector." Several Nebraska beemen who had time, have been to the Iowa meetings and they were so loud in their praise of Professor Millen that we have made arrangements to have him speak.

W. P. Southworth, of Sioux City, will give a talk on "Modern Equipment of the Apiary." Mr. Southworth is President of the Western Honey Producers' Association and they have made such a success of their co-operative work that we have found it desirable to hear how they do their business.

At the finish of our meeting we will hold an open discussion or question box, which will be handled by Mr. H. C. Cook, of Omaha. In Mr. Cook we have a man who has proven what Nebraska is capable of producing when it comes to honey, and I am sure that nearly every beekeeper in the State knows him.

O. E. TIMM, Sec.
Bennington, Nebr.

Heat Insulators for Beehives

The last quarterly report of the Michigan Agricultural Experiment Station contains an article on the above subject from the pen of R. H. Pettit based on experiments conducted with the aim in view of determining the value of different materials for the purpose of wrapping bees wintered out of doors. We quote the article in its entirety:

"So many claims have been made by users of corrugated paper for the purpose of wrapping and thus retaining heat in winter beehives, that it seemed worth while to test the heat insulating value of corrugated paper as compared with several other forms of packing or wrapping material in common use. These various materials were compared with dead air spaces in standardized chambers of cubical form, the chambers being double-walled, and each being provided with a 2-inch space on all sides, suitable for packing the materials to be tested.

"The experiment was started in 1916, being planned by the writer and started by Mr. G. C. Woodin, an assistant in the experiment station at that time. The observations were completed by Mr. P. B. Wilteberger, the successor of Mr. Woodin, who also computed the resulting data.

"These chambers were stored in a comparatively cool place and a constant source of heat applied electrically inside. Readings were taken, at intervals, of the temperature maintained inside the chambers and these were checked against a chamber of similar construction, but which was provided merely with dead air spaces on all surfaces.

"As will be apparent, the results aimed at are merely comparative. The materials tested were corrugated card board, dried leaves, planer shavings and mineral wool. In all cases enough material was used to supply a 2-inch layer of the material under observation. From our tests it would appear that the heat insulating values of the various substances compare about as follows:

Dead air space	18
Corrugated card board	33
Planer shavings	34½
Mineral wool	35½
Forest leaves	41

"Omitting dead air space from consideration, then corrugated card board, the most expensive material used, is least efficient, and ordinary leaves raked up, dried and firmly packed, give the best results of any. They have the further advantage of being easily obtained and are the cheapest material that we could find.

"Tests were also made to determine the relative rates of heat loss when one surface of the chamber was left unpacked. When the bottom surface was unprotected there was a loss of about 3½ degrees Fah., in temperature. One unprotected side produced a loss of 4 degrees. With the top surface alone unprotected, a loss of nearly 5 degrees resulted, which plainly shows us that the loss in temperature from leaving the bottom unprotected is very considerable, indeed."

R. H. PETTIT,
Entomologist of experiment Station.

Spring Losses—Caucasians

The difficult problem of this locality is to get the bees through the spring from the middle of March to the first of May. My loss during this time has never been less than 25 per cent. The loss occurs with both the outdoor and the cellar wintered. I believe the cause is the absence of bloom for the bees to work on during the days they can fly. Pollen substitutes and feeding do not seem to be able to check the loss.

Last April, when I set the bees out of the cellar, I left a nucleus in the cellar to see how long it could be kept there. It stayed there until the first day of May. The cluster at this time was no larger than a quart measure. Salt sage was beginning to bloom when I set it out, and there was soon an abundance of pollen for the bees to gather. Instead of dwindling, as the others did, this nucleus held its own, was soon gaining, and was ready for supers before many of the colonies that had been set out the first of April. I believe the difference is that the bees of the nucleus were kept inactive till there were natural stores for them to gather. By reason of this experience I intend to keep 300 colonies in the cellar till the first of May next spring.

In the season of 1915 I procured a Caucasian queen to be used as a breeding queen. During the past season three daughters of this queen gave me a total of 850 pounds, 125 pounds of which was extracted. This

is by far the largest yield any three queens have given me in one season.

JOHN HENDRICKS,
Powell, Wyoming.

New Jersey Beekeepers' Association

The annual meeting of the New Jersey Beekeepeers' Association will be held in Trenton, N. J., January 16-17, 1919. The program follows:

Thursday Morning, Jan. 11

10:00—Report of Secretary-Treasurer.

10:30—Address by President Barclay.

11:00—Economical Extracted Honey Production, Allen Latham, Norwichtown, Conn.

Thursday Afternoon

1:30—"An Economical and Efficient Hive Paint." E. D. Warde, Arlington, N. J.

2:00—"Survey of Beekeeping in Morris and Somerset Counties." E. G. Carr, Deputy Bee Inspector for New Jersey.

2:30—"Honey Production as a Business." Morley Pettit, Georgetown, Ont.

3:15—"Queen-Rearing for the Honey Producer." Allen Latham, Norwichtown, Conn.

3:45—"Outdoor Wintering of Bees." E. G. Carr, Deputy Bee Inspector for New Jersey.

4:15—"Boy Power in the Apiary." R. D. Barclay, President New Jersey Beekeepers' Association, Riverton, N. J.

4:30—"The Value of Agricultural Fairs to the Honey Producer." C. N. Greene, Apiary Adviser, Harrisburg, Pa.

Thursday Evening

7:15—"Honey Cookery." Mrs. Frank App, State Leader in Home Economics, New Brunswick, N. J.

7:45—"Beekeeping." Morley Pettit, Georgetown, Ont. A popular lecture, illustrated by three reels of motion pictures.

Friday Morning, January 17

9:00—Unfinished business and election of officers.

9:30—"Extracted Honey Production." Morley Pettit, Georgetown, Ont.

10:15—"The Two-Hive-Body System of Beekeeping." Allen Latham, Norwichtown, Conn.

11:00—"The Outlook for the Honey Producer in the East." C. N. Green, Apiary Adviser for Pennsylvania.

E. G. CARR, Sec.-Treas.,
New Egypt, N. J.
RICHARD D. BARCLAY, Pres.,
Riverton, N. J.

Michigan Meeting

The annual convention of the State Beekeepers' Association will be held in Lansing on January 21-23. The place of meeting and other particulars will be announced upon the program, which will be in the mail by January 1. Anyone desiring a program should write to the Secretary, East Lansing, Mich. The headquarters will be the Detroit and Kerns (Wentworth) Hotels. A banquet will be held on the evening of January 22. Everyone should be on hand for the President's address, which will be delivered at 1 p. m. on the 21st. This will be followed by the following subjects and others to be announced in the program:

"Large Hives," C. P. Dadant, E. R. Root, J. N. Harris and others.

"Co-operative Marketing," J. N. McBride, State Director of Markets.

Address—Hon. Geo. A. Prescott, Federal Food Administrator.

"The County Association," Miss A. Sly.

"Two Queens in One Hive," Arthur Sharrow.

"Combless Packages," E. A. Leffingwell.

"Honey Resources of the Upper Peninsula," B. F. Kindig.

Other subjects and general information on printed program.

B. F. KINDIG, Sec.,
East Lansing, Mich.

Minnesota Meeting

Because of influenza, the annual meeting of the Minnesota Beekeepers' Association was postponed from December to January 2 and 3, Room 4, Plant Pathology Building, University Farm, St. Paul, Minn.

L. V. FRANCE, Sec.

National Beekeepers' Association

The annual convention of the National Beekeepers' Association will be held at the Hotel La Salle, Chicago, February 18, 19 and 20, 1919.

The complete program has not been arranged, but the following speakers expect to attend:

E. R. Root, editor of Gleanings, "Past, Present and Future of Beekeeping."

C. P. Dadant, editor of the American Bee Journal, "International Beekeeping."

E. D. Townsend, editor of the Domestic Beekeeper.

Dr. E. F. Phillips, Bureau of Entomology, Washington, D. C., "Factors Influencing the Secretion of Nectar."

Prof. F. Eric Millen, Iowa Agricultural College, "Beekeeping as Seen by a Bee Inspector."

Prof. E. G. Baldwin, Extension Service Dept., Purdue University, Indiana..

Kenneth Hawkins, Plainfield, Ill., "Beekeeping in Dixie."

Prof. H. F. Wilson, University of Wisconsin, "Organizing Local Societies."

Chas. B. Justice, General Manager California Honey Producers' Co-operative Exchange.

Dr. C. C. Miller expects to attend one day, if he is able.

A question box will be featured at each session and with the very highest authorities on the different branches of the beekeeping industry present, no beekeeper can afford to miss this convention.

FLOYD MARKHAM,
Sec.-Treas.

Western New York Honey Producers' Association

The postponed meeting of the Western New York Honey Producers' Association will be held at the Genessee Hotel, Buffalo, N. Y., on Friday and Saturday, January 10 and 11, 1919. Program on request.

HOWARD M. MYERS, Sec.,
Ransomville, N. Y.

UNITED STATES DEPARTMENT OF AGRICULTURE

Bureau of Markets

Honey arrivals since last report:

Medina, Ohio—57,400 lbs. from Ohio and 34,500 lbs from Idaho arrived.

Hamilton, Ill.—No arrivals.

Keokuk, Iowa—2,760 lbs. from Iowa and 74 lbs. from Illinois arrived.

Shipping Point Information

San Francisco, Calif., Nov. 30—Supplies light. Demand and movement moderate. Cash to producers at country loading points: Extracted, per pound, water white, 22-23½c, sage white, 20-23c; light amber, 18-20½c; dark amber, 18-19c. Beeswax: supplies moderate, 35-40c per pound.

Los Angeles, Calif., Nov. 30—Supplies very light. Very few sales. Cash to producer on farm: Extracted, per pound, white, supplies practically exhausted, too few sales to establish market; light amber, sage and alfalfa, 21½-22c; amber, no sales reported. Beeswax, 36-37c per pound.

Chicago—1 Utah, 1 Colorado and approximately 1,000 packages from Illinois, Wisconsin and Michigan arrived. Demand and movement slower, little change in prices. Sales to jobbers, Wisconsins and New Yorks, extracted per lb., buckwheat, No. 1, 21-22c; Utahs, Colorados and Illinois, extracted per lb., white, No. 1, 25-27c; amber, 22-24c; comb, No. 1, 24-section cases, $6-6.50. Beeswax, 40c per pound.

Denver—Approximately 40,000 lbs. extracted arrived. Receipts moderate. Demand and movement slow; no change in prices. Few sales. Sales to jobbers, extracted per lb., white, mostly 25c; light amber, 24c; comb, 24-section cases, white No. 1, $6.30; No. 2, $5.85. Beeswax, 38c per pound.

Kansas City—No arrivals, no cars on track. Supplies light. Demand and movement slow, little change in prices. Quality and condition good. Few sales. Sales to jobbers, Missouri, extracted, no sales reported; comb, light amber, 24-section cases, No. 1, $8.50; Colorado, light amber, 24-section cases, No. 1, $7.50-7.75.

Cincinnati—1 Nevada arrived, L. C. L. receipts moderate, nearby receipts very light. Sales to jobbers: Extracted, per lb., demand and movement slow, little change in prices. Alfalfa and sweet clover 29-30c, amber, no sales reported; comb, demand and movement good; white, 24-section cases, No. 1, $7-7.25; fancy, $7.50. Beeswax: demand slow, few sales, yellow average 40c per pound.

Minneapolis—Home-grown receipts light. Demand and movement good. Supplies moderate. Sales direct to retailers, Californias, Minnesotas and Colorados, extracted, per pound, prices slightly higher; quality and condition generally good; 60-lb. cans, 26½-30c; Colorados, comb, no change in prices; quality and condition good, white fancy, 24-section cases, $7-7.25.

St. Paul—Home-grown receipts light. Supplies moderate. Demand and movement good; no change in prices. Sales direct to retailers, Colorados and Minnesotas, few sales. Extracted per lb., mostly 30c. Colorados, quality and condition generally good; comb, white fancy, 24-section cases, $7-7.25.

Spokane—No arrivals; supplies light. Demand and movement slow; very few sales, on account of high prices. Quality and condition good. Sales direct to retailers, Idahos, extracted, per lb., 5 and 10-gallon cans, white alfalfa, 27-28c; comb, white alfalfa, 24-section cases, No. 1, $7-7.25; No. 2, $7.

Philadelphia—5 barrels southern, 4 kegs and 75 cases containing 10 gallons each from New York of extracted and approximately 900 cases of comb from New York arrived. No demand, very few sales. Sales to manufacturer, extracted, southern, $2.55-2.60 per gallon.

New York—400 barrels and 50 tierces from Porto Rico arrived. Demand moderate; little change in prices. Porto Rico, extracted per gallon, $2.35-2.60; mostly $2.45; California extracted, per lb., white, 27-29c; light amber, 24-27c; New York Comb, 24-section cases, 30-35c per lb. Beeswax: 320 bags from Porto Rico arrived, demand moderate; imported, dark, 40-42c per lb.; domestic, light, 42-44c per lb.

Cleveland—24,600 lbs from Nevada arrived. Demand slow; no change in prices. Sales to bakers and wholesale confectioners; western, extracted, per lb., white orange blossom, 60-lb. tins, 33c; light amber and sage, 31c; white clover, 28-30c.

St. Louis—Supplies light. Demand moderate. Sales to jobbers, southern extracted, per lb., amber, barrels 24-25c. California and southern, extracted, per lb., amber, cans, 26-28c; Comb, practically no supplies on market. Beeswax: prime, 41½c per pound.

Portland—Demand and movement slow. Quality and condition ordinary, mostly amber. Sales direct to retailers, extracted per lb., 24-27c; comb, 24-section cases, $6.75-7.75, according to weight and grade.

DR. MILLER'S ANSWERS

Send Questions either to the office of the American Bee Journal or direct to DR. C. C. MILLER, MARENGO, ILL.
He does NOT answer bee-keeping questions by mail.

Wintering in Cellar

I have been reading your answers to bee-keepers for the last ten years and have found almost every question pertaining to bees answered. Would it not be better to winter bees in a house cellar than out of doors, even though the temperature gets near the freezing point. I had one colony which I neglected to pack last fall. About the 15th of December I put it in the cellar without packing of any kind. The entrance was nearly closed with dead bees and ice, but it came through all right and gave me over 100 boxes of surplus, or as good as any of my colonies. NEW YORK.

ANSWER.—Occasional cold in a cellar is not so bad as steady cold. I would rather risk a cellar with the temperature occasionally below the freezing point and at other times at 45 degrees or higher, than one with a steady temperature of 38 or 40 degrees. Again, much depends on purity of the air. I would rather risk 40 degrees with the air constantly changing than 50 degrees with stagnant air. The fact that you did well with the cellar last winter is a pretty good indication that you ought to do as well other winters.

Using Old Combs

1. I have six empty hives; the bees, I believe, died from European foulbrood. The hives have not contained bees for two years. Do you think I could put bees into these hives next summer and leave the old comb in them without danger to the bees? If this is not possible, please let me know how I could "cure" the hives.

2. If I would send you a piece of comb could you tell me what kind of disease the bees died of, or what kind of foulbrood it is?

3. Does it make any difference whether comb is black or white when it is sent to a manufacture to be made into foundation?
WISCONSIN.

ANSWERS.—1. If the disease is of the European sort, and not American the hive and all its parts may be used without "curing," except the combs. In an apiary entirely free from European foulbrood I should hesitate about using them. As to "curing" them, that is, getting rid of all the germs in them, that possibly might be done by using them for one season as extracting combs; although some might be over-anxious enough to think there would be danger in that.

2. No; it would likely do no good to send samples to me; send them to Dr. E. F. Phillips, U. S. Department of Agriculture, Washington, D. C. If you write to him in advance he will send you a box in which to mail the sample, and after receiving sample will advise you fully what to do, all without charge.

3. No.

Sugar Feeding in Cellar

I have about 170 colonies of bees and they are very light and I am afraid that I am going to lose the biggest part of them. I have put them in the cellar just the last few days, and it really makes my heart ache to see them in such a condition and that I am unable to do anything for them. The honey crop here was almost a total failure. Hardly any of the bee-keepers got any honey. I got a little, and when I filled out my application for sugar I told them just what I had, but before I knew that I could not get sugar I had sold a part of my honey. I fed 900 pounds of it and still the bees need more, and I have almost begged for sugar, but to no avail; they wrote me that I would have to take my medicine, which was, I think, rather a hard way to talk to a fellow. They claim that I was profiteering, but such was not my intention. I had honey enough to have carried my bees through if I had fed it all, but at the time that I fed I thought I had given them enough. I got, all told, 2,800 pounds. Now I have some hopes that things will shape around before long so that sugar will be available and what I would like to have you tell me is how can I feed my bees in the cellar. I have never had to feed much, and don't know anything about cellar feeding and have no receipt for making candy for that purpose. I have put the light colonies on top as near as possible, but of course there are so many they could not be all on top. What would be the consequences if sugar syrup was fed in the cellar?

I would be very thankful for information as to how to proceed in case that I get sugar and would gladly pay you for the information if you would take anything.

Is there any way I can feed the lower colonies in the tiers. ILLINOIS.

ANSWER.—If you feed syrup in the cellar it is likely to stir up the bees to such an extent as to make serious trouble. Candy is far safer. To make the candy is not so very difficult. Into hot or boiling water stir as many quarts of granulated sugar as there are quarts of water. Let the sugar be stirred in slowly, stirring all the while. Pouring in the sugar will, of course, cool down the mixture, and that is all right, for you should make sure that all sugar is thoroughly dissolved before it begins to boil, lest some of the undissolved sugar be scorched, which would be fatal to the bees. From time to time drop a little of the syrup into cold water. It will be ready to pour out when it is brittle upon being dropped in the cold water, and yet appears a bit soft and tough when put in the mouth. Have the top of a table perfectly level, and lay on it sheet of waxed or paraffined paper, with wooden strips one-fourth inch thick under the edges of the paper. As soon as you find your hot material is at the right stage, pour it onto the sheets of paper, and of course when it is cool you will have sheets of candy one-fourth inch thick. When it begins to harden, take a knife and score the places where you want to break the candy, so as to make it the right size. All you have to do now is to lay these thin cakes of candy on top of the top-bars and cover up warm.

The cakes of candy being so thin, it may be you can succeed in shoving them into the entrances of hives not on the tops of the piles. If there is considerable space between the floor and the bottom-bars it will be advisable to thrust thin strips of wood under the candy, so it will be raised up against the bottom-bars, thus making sure that the bees will get at the candy. Even then a weak colony might not get down to the candy. It might help to warm up the cellar, and possibly to blow into the hive entrance.

Color of Crossed Bees

1. What is the color of worker bees from a tested leather color Italian queen?

2. How can the difference between the hybrid and 3-banded be detected if the hybrid is a cross between blacks and goldens?
NORTH CAROLINA.

ANSWERS.—1. When color enters into the naming of any kind of bees, it is the worker and not the queen that is considered; so when a leather-colored queen is mentioned it means that her workers are of that color.

2. The workers of a hybrid colony will be mixed in appearance; some of them may be like one side and some like the other, or the same bee may be midway in appearance between the two.

Requeening

Next year I intend to buy untested queens for each colony, then just as clover opens up I will go to each colony and take the old queen with one frame of brood and bees and start a new colony. Could I give the old swarms the new queen right away? Would they be safe from swarming the first summer? Would you approve of this method?
MINNESOTA.

ANSWER.—Yes, you can give the new queen right away, of course with the usual precautions upon introducing and the likelihood is that there would be no swarming until the following year, it being taken for granted that the new queen will be one that has been laying but a short time. But I think you will be wise to make a change in the program, proceeding in this way: Instead of taking away

the queen with one frame of brood, leave the queen with one frame of brood in the old hive and take away all the rest of the brood with adhering bees, introducing the new queen to these latter bees. In this way the introduction of the queen will be safer, for the field bees will all return to the old queen, and it is the old bees chiefly that make trouble when a new queen is introduced. There will also be less danger of swarming.

It is quite possible that you will reply, "Yes, but I would like to have the new queen with the main colony, so that there would be a bigger harvest." Believe me, the harvest depends chiefly on the force of bees left by the old queen, and the bees that will come from the brood she has left. In a good season, especially if you have a fall flow, you may get surplus from both divisions, whereas, if you take away the queen with one brood, you can hardly expect any surplus from this offshoot.

(In addition, a new coloniy, made with only one frame of brood and bees, with the old queen, and put on a new spot, may be too weak. At the same time, the colony from which this one brood and queen have been taken may remain strong enough to prepare queen-cells and swarm with the new queen introduced to it. So the method advised by Dr. Miller is the better method, by all means, if no natural swarming is wanted.—Editor.)

Miscellaneous

1. What caused my bees to swarm out and then return and carry out the queen?
2. I intend to transfer my bees in Jumbo hives. Can I produce comb honey with this hive? Which would be the better, the 8 or 10-frame?
3. I have heard that bees will not stay in a home-made hive unless it is washed with salt and water. Can you tell me if this is true?
4. Do you think I can buy nuclei on Jumbo frames?
5. Would a 3-pound package of bees with queen do well if put in a Jumbo hive with frames of foundation?
6. Do untested queens prove successful?
7. What do queen breeders mean by the term (selected) tested queens?
8. How long does it take a virgin before she is a laying queen?
9. What should be the distance between bottom-board and frames and between top of frames and super?
10. How long will bees live without a queen?
11. Will there be a big demand for comb honey the coming season?
12. Will the pound-package men have as much trouble filling orders the coming season as they had last year?
13. What is the size of the Dadant shallow extracting frames?
14. What depth of shallow extracting frames would prove the best on Jumbo hives?
15. Will bees chew cardboard if used in the hive as a division board? ILLINOIS.

ANSWERS.—1. It is quite possible it was a second swarm, having two or more young queens. Such swarms not infrequently return to the hive, perhaps because the chosen queen has been fertilized and then the superfluous queens are killed and carried out.

2. Yes, and perhaps the larger hive may be better.
3. That's all bosh.
4. Doubtful.
5. Yes, of course, with a good season.
6. The great majority of them do; but of course some are unsatisfactory.
7. It's the ones they pick out as being better than the average, in their opinion.
8. She is likely to be laying when 8 or 10 days old, but sometimes later.
9. About ¾ and ¼ inch, respectively.
10. In the working season such a colony will last something over two months.
11. I don't know, but expect a good demand for both comb and extracted.
12. I don't think so.
13. Six and a quarter inches in depth.
14. About 6 inches, likely.
15. Sure.

Pound Packages

1. What can I do to keep the little worms or maggots out of comb honey after it is taken off the hive and put away for winter? I put some up in pound cartons and when I went to use it, it was full of worms.
2. Can I send south and get pound packages of bees with queen? When they come can I go to my strong swarms, take out frame of brood and give it to them? Will they be strong enough to take care of them? Or would it pay better to get 2-pound packages?
3. Will it weaken the swarms I take the brood from enough to affect their honey production?
4. I requeened some black bees with Italian queens about September 20. I looked about three weeks later to see if they accepted their queens. I found every cell full of honey or beebread, but could not find the queens. Do you think it was too late for them to lay eggs this fall?
5. If the queens are dead will they go through the winter. Can I requeen in the spring?
6. Do you think a few cells of American foulbrood will disappear in a colony of bees by keeping it strong with a prolific queen? NEBRASKA.

ANSWERS.—1. The best thing is to have Italian bees that will keep the moth at bay. Even with them it is possible that there may be some trouble with "worms" in comb honey, in which case you should fumigate the combs before the little pests come to good size, say two weeks after the combs are taken from the hive. You can fumigate with burning sulfur, in which case the eggs of the moth will be unharmed, and you must fumigate again when they have hatched, say two weeks later. If you fumigate with carbon disulfide no second fumigation will be needed, as eggs and all will be killed.

2. You may do very well with a one-pound package, but a larger package with more combs will be better on the whole.

3. Yes, taking away brood from a colony will lessen its yield, but the gain may be more than the loss.

4. It may have been; it is impossible to say.

5. Yes; but a queenless colony is not likely to winter so well as one which has a queen.

6. No; instead of disappearing it will increase.

Uniting

This is not a good beekeeping locality, and I am not a good beekeeper. I am looking for a system as near automatic as possible, that will yield about 10 pounds of chunk honey per colony in an average year. I think I could get some honey by the old method of smothering half the colonies every fall and then dividing the remainder every spring, as they seem to get enough to winter even when too weak to draw out all the combs. Do you think it would be practicable to divide a colony in spring and put one-half with the old queen in another hive on top of the old one, with a 3-inch double screened hole in the center of cover of lower hive, so that the two hive scents would remain similar; then kill the top queen in the fall and take all the honey that wouldn't go in the lower hive? I suppose it wouldn't do to unite them without killing one queen, even though she happened to be hard to find. MASSACHUSETTS.

ANSWER.—Your scheme might work to your satisfaction sometimes, and sometimes not. There would be no trouble uniting in the fall, for you could unite without finding either queen, leaving to the bees or the queens themselves which should be left. But there might be trouble galore long before fall. I suppose you are counting that when you put the queen in the upper story the bees will rear another queen in the lower story. Very likely; and when the first queen emerges the bees may decide that that is a good time to swarm, the very thing you are trying to avoid. Why not vary the plan, making it the Demaree plan? When the season has advanced so that you think there may begin to be danger of swarming, put all but one brood in an upper story, leaving the queen with the one brood in the lower story, vacancies being filled out with drawn combs or full sheets of foundation, and a queen-excluder between the two stories. A week or ten days later kill all cells in the upper story. Then you will be saved all trouble of uniting in the fall, and have only honey above the excluder. Of course this honey will be in old combs, but it would be in your proposed plan. The best thing will be to extract it, and you should not be satisfied with any such amount as 10 pounds per colony.

Moving Bees

I have 60 colonies in 10-frame, dovetailed hives, and I am going to have them moved 700 miles by freight. Will you please tell me what is the best way to pack them? ILLINOIS.

ANSWER.—In the limited space allowed I cannot go into very full particulars, but will say in general terms that you must plan so that the hives shall not be allowed to move about; that they shall be placed so that the frames of the hive shall run parallel with the rails of the road, and that plenty of ventilation must be allowed if weather should be warm, and if a very hot spell should occur water must be sprinkled upon the bees.

A Start in Beekeeping

I have always been afraid of bees. But a swarm took possession of some empty space under the floor of my chicken house this summer and I had to do something. After much reading, I made a hive according to directions and said to the bees what Sir Nigel said to the yellow horse: "I am your man and you are my bees."

I puffed a bit of smoke at them and in they went. but sooner than I could say it they came out again in force, so I put down the smoker and pried up the floor. That broke the combs loose from the floor boards and left them on the ground, and the bees sticking to their combs for dear life. They let me lift them up off the ground, one piece of comb at a time, and put them in the hive.

It was only a little while till I had them so tame I could go out and lift off the cover and tickle their little whiskers, or whatever you call it, and they seem to be as glad to see me as to see their queen.

But, doctor, how should a new fellow like me go about it to build up an apiary? COLORADO.

ANSWER.—That question nearly takes my breath away. One way is to serve an apprenticeship of seven years or less with some good beekeeper. Another way, one that will probably suit you better, is to spend a part of your time this winter studying a good textbook on bees, such as Dadant's Langstroth, and then be ready next spring to go at the matter understandingly. Now that's a very general answer, isn't it? Well, your question is a very general question. In the meantime it will be no harm for you to get the book containing my answers to 1,000 beekeeping questions, and when you find some particular question arise that does not seem answered by any book you have, send that question to me and I'll do my best to answer it in this department. That's just what this department is for.

Carniolans or Italians—Kind of Hive

1. Would I get better results in raising a nucleus colony with a Carniolan queen than I would with an Italian? My beebooks say that Carniolans rear large quantities of brood.
2. What kind of hives would you use (double-walled or single) to winter bees out of doors in northern Indiana?
3. What do you think about A. G. Woodman's Protection Hive? INDIANA.

ANSWERS.—1. You would probably find not much difference, and I would expect as good results from Italians.

2. Like enough single-walled, well packed.

3. I have had no experience with it. but suppose it to be a good hive.

Sheets of Foundation Short

I use the regular Hoffman frame, and I bought some comb foundation of a company this fall, and it is about three-eighths of an inch shorter than the length of the frame, leaving a space of about three-eighths of an inch between the foundation and the end-bar.

Would you advise me to put the foundation in the center of the frame, or put it to one side and leave the three-eighths inch space on the other side, between the foundation and the end-bars? VERMONT.

ANSWER.—With proper precautions it is possible to have foundation cut so as to fill the frame entirely, and have it built out all right; but the foundation is quite commonly inclined to do a little stretching, in which case there is some buckling, making bad work. So your foundation was probably advisedly made a little scant so a little stretching could be adjusted, with the expectation that you would allow the space to be equal at the two ends.

Queen Cells—Queen Introduction—Brood Wintering

1. Can one or more queens be successfully wintered in one colony? If so, what is the method?

2. Are queen cells ever built horizontally? If so, are queens that are raised in them as good as those raised in vertical cells?

3. Is there any noticeable difference in the activity and production of colonies whose entrances face the west, as compared to those facing east?

4. What are the good or bad points of a frame with end and bottom bars the same width as the top bar, other dimensions being standard?

5. I introduced queen to colony 24 hours queenless, about September 23. The queen was weakened, some attendants being dead. A week later I could see a few golden bees on the combs among the blacks, but found no queen. Quit feeding on November 1. No brood. Saturday, November 2, the new queen arrived, was placed in the cage on frames above the cluster. At 4 p. m. Monday evening candy was nearly eaten through. Tuesday evening about half of the attendants were dead and beeway not quite through the candy. I removed the screen on edge of cage and replaced it above cluster. Wednesday evening still some candy in cage; all but queen and two attendants dead; queen still active; removed wire screen and placed case on its side over cluster November 16 bees were flying nicely, but no indications of robbing. November 17 opened hive and found plenty of stores and about 200 cells of capped brood; also about a dozen cells of brood in the earlier stages of development, all apparently unharmed. Every bee was dead, the hive bottom covered; also the ground in front of the hive was strewn with dead bees. The queen had what seemed to be a sting in her side near the base of the wing What do you think was cause of this?

6. Please recommend a good book on the honey flowers of North America.

7. Is catnip a good honey plant?

8. I have some old brood combs that are quite black. Can they be bleached and still be good for brood?

9. Can a colony winter too warm? For example, if packed in sawdust so that little or no heat would escape and weather conditions would have to vary extremely to affect it from the outside?

10. March, 1909, page 101, you say: "Let bees swarm and * * * 21 days later add rest of bees to swarm and melt up the combs" Why on the 21st day? If a new queen is present in the old hive, will there not be brood then?

ANSWERS.—1. No; although two or more nuclei, or two colonies, may be wintered in the same hive, separated by thin, bee-tight partitions.

2. In rare cases, where the cell is crowded for room, as on the edge of a comb next to a bottom bar, I've seen them horizontal. They're likely as good as any. I've turned cells upside down, and the queens from them had a stubby posterior.

3. I've had them facing all ways and could never make out any difference, although it is possible that in some cases there might be a difference.

4. The Miller frame, which I have been using for years, has top-bar, bottom-bar and end-bars uniform in width, 1⅛ inches, throughout their whole dimensions I'm not sure that either advantages or disadvantages are worth quarreling about. The frame is a trifle stronger for the greater width, and the smaller space between end-bars and bottom-bars makes a little less building of bits of extra comb. The wider bottom-bar is more in the way of an uncapping knife.

5. I don't know. You say there was no indication of robbing on the 16th, and plenty of stores the 17th, so that bars out robbing, and I have no other guess.

6. There is no such book published that we know of. However John H. Lovell has published a book, "The Flower and the Bee," which is on the pollen plants. Our associate editor, Frank C. Pellett, is writing articles on the honey plants, and these will be published in the American Bee Journal from time to time.

7. Excellent.

8. I don't think so; the bees prefer the blackest.

9. I doubt about the "too warm"; but it's just possible too much packing might under some circumstances make it too cold, not allowing the sun to heat up the hive on a warm day. But I may be mistaken in that.

10. The swarm usually issues when the first queen cell is sealed. Then in 21 days the young queen would hardly have more than eggs, or so little brood as to be negligible.

Moving Bees in Oregon

We wish to move our apiary of about 120 colonies during February or March, 18 miles by river boat, then transfer to box-car, and 150 miles by rail. This is a very rough and mountainous country, and travel is often slow and uncertain. Bees may have to be shut up for several days, probably not less than 5 or 6. Though we have but little freezing weather there is no really warm weather during our winter months. With a few sunny days now and then bees fly more or less all winter, often bringing in some pollen. Our practice is to leave on a shallow super containing some honey for winter stores, which in moving will give them extra air space.

1. How much top ventilation, if any. would
2. If bees are active they will need water
2. If bees ar eactive, will they need water while shut in?. It is nearly always cool here in the shade, even during summer. Would like suggestions on moving bees under our conditions. Honeyflow starts here in April. OREGON.

ANSWERS.—1. Something depends upon the amount of bottom ventilation. If your hives are like mine, with entrance 2 inches deep, and 2 inches space under bottom-bars, in a cool time there might be no need of further ventilation. Otherwise it might not be safe, and it may be better to have wire cloth the full size of the top.

2. Under such circumstances they are likely to need water, especially if they crowd against the opening, in which case a very strong colony might be suffocated. Spraying with water will not only quench their thirst, but cool them off and drive them back.

Large Packing Cases

I packed my sixteen colonies of bees in winter case big enough for same by making two rows of them, eight in row, in block form, back to back, and snug in rows; would they mix with one another when out on flights, enough to hurt?

I use matched lumber 16 ft. long to make this case. I find it cheaper, also much easier. NEW YORK.

ANSWER.—With eight colonies in a straight row standing close together, there will be some danger of mixing if all are just alike, with no objects to help mark the location. A tree or a post standing in front of the hives will help greatly. If there is nothing of the kind, you can stand a board, leaning against the hives at the middle of the row. It might be better to have two boards, one 5 feet or so from each end.

Feeding in Winter

1. I have 29 colonies of bees that will need feeding in early spring. I don't want to disturb them to note their condition, on account of the packing, which I want to leave on until warm weather. I want to feed in the open. Will there be danger of some filling their hives too full? How thin should the syrup be, and how much ought I to allow for each colony?

2. If I should leave a super of honey on each hive through the winter and remove it before clover blooms, would it extract all right? MISSOURI.

ANSWERS.—1. Without knowing how much honey is in each hive, it isn't easy to say how much you should feed. At any rate, you will hardly be in danger of crowding any brood-chamber if you give not more than 10 or 15 pounds of sugar (not syrup) for each hive. Hardly that much will be needed. Equal parts of water and sugar will work all right.

2. There is some danger the honey may be candied.

The Illinois Meeting

Owing to the raging influenza, the Illinois meeting held in December, had the smallest attendance it has had for years, barely 20 being present. Illinois rarely has a large attendance of beekeepers. This is more strange since the association is one of the largest in numbers in the United States, having at present nearly 500 enrolled members. This is probably due to the fact that the annual report of the meeting is published in book form.

However, if the Illinois beekeepers who read this could appreciate what they miss by failing to attend, more of them would go in the future. The personal intercourse, between members, the getting acquainted with leading beekeepers (we had Pettit and Miller this time), the occasion offered to ask questions to be solved, all combine to make the meeting both pleasant and useful.

At this meeting 24 questions on different subjects concerning bees were asked, discussed and answered. Beekeepers of Illinois, do not fail to attend future meetings.

We will give a short synopsis of this meeting in February.

Nebraska Meeting Postponed

Owing to influenza restrictions, the Nebraska meeting, mentioned elsewhere in this issue, is postponed indefinitely

Texas Beekeepers

Dallas County, Texas, beekeepers organized recently with 26 charter members. W. E. Joor, of Dallas, was chosen President, and A. D. Fraser, Secretary. The association will meet again the fourth Tuesday in January.

Established 1885

We are still furnishing beehives made of white pine; they will last. A. I. Root Co.'s make of bee supplies kept in stock. Send for catalog giving full particulars; free for the asking. Beeswax in exchange for supplies, or cash.

JOHN NEBEL & SON SUPPLY CO.
High Hill, Montg. Co., Mo.

The Domestic Beekeeper

PUBLISHED for the honey producer, by a honey producer. Every honey producer should know and subscribe for the *Domestic Beekeeper*. The *Domestic Beekeeper* will help you to produce a crop of honey, when harvested it will help you to dispose of it to a good advantage. Thousands of dollars have been saved beekeepers by following the advice of the *Domestic Beekeeper* on the sale of honey. If you have received less than 25c per pound, in 60-pound cans for your best 1918 crop of extracted honey, you are likely not a subscriber to the *Domestic Beekeeper*, or, have not followed the advice of the editor. Isn't it about time that you got out of that "rut" and sell your honey to a better advantage? The *Domestic Beekeeper* for 1919 will advise you from month to month what the Jobber is selling for and instruct you how to secure *his* price for your product, which is usually two to three cents per pound more than *he* will pay you. Get next to this better way of selling before your 1919 crop is ready for the market, by subscribing for the *Domestic Beekeeper* at once.

From many kind letters received, we will submit three late ones which will give the reader a fair idea of what our subscribers think of the *Domestic Beekeeper*.

Remember that it does not cost *Domestic Beekeeper* subscribers a cent to sell their honey to a good advantage, as we advertise it for them free of cost.

Why not every one of the readers of the *American Bee Journal* dig up a dollar and send it in at once and secure the twelve numbers of the *Domestic Beekeeper*.

The three letters referred to above follow:

LIBERTY CENTER, OHIO, November 12, 1918.

The *Domestic Beekeeper:* I have for sale sixteen 60-pound cans of clover honey that you may list in your free list of those having honey for sale. I take this opportunity to thank you for holding my last year's crop.

I think the late W. Z. Hutchinson and yourself have done a good many more kind acts to beekeepers than any other publication I know of. I expect to read your *Domestic Beekeeper* as long as I keep bees and can dig up the price. I surely appreciate your kindness.

S. A. PALMER.

CONTINENTAL, OHIO, October 31, 1918.

The *Domestic Beekeeper:* Please discontinue my name in your honey for sale column, for I am all sold out and am returning checks every day. Wish I could have filled all the orders which came, as they surely came with a rush, and one large order by tele graph, which was filled the next day. Your journal is surely the best honey market journal in the whole country, as it surely keeps tab on the market. Had I seen the October number before naming a price, would have asked 27c, and am sure it would have all gone soon at that price, as I could have sold three times as much at the 25c mark.

Enclosed please find a dollar for 1919 subscription to the *Domestic*, and thanks for your valued help. JUDSON A. JONES.

BAGNALL, MICHIGAN, November 11, 1918.

The *Domestic Beekeeper:* Please discontinue my name in your free column of those having honey for sale, as I am all sold out. Sold my white and buckwheat extracted in 60-pound cans f. o. b. here at 25c per pound. Thanking you for past favors, I remain,

C. J. FREEMAN.

Send in your dollar at once to the DOMESTIC BEEKEEPER, Northstar, Michigan, for your 1919 subscription.

A PATRIOTIC BEEKEEPER

Will Heed Our Government's Plea to Keep More Bees and Keep Them Better

To do this it is essential to get your supplies now and do all preparatory work during the winter months, then spend your time next summer *Producing Honey*.

The profit is worth the effort. Besides, you can save money by ordering now. Get our prices and early order cash discounts.

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DEPARTMENT A

301 Eleventh Avenue **Council Bluffs, Iowa**

Crop Report and Market Condition

Compiled by M. G. Dadant

For our January report, which will likely be the last one of any length for a few months, we asked the following questions of reporters:

1. Have you any honey left on hand unsold; if so, how much and at what price are you holding it?
2. How is the honey moving and what are the prices?
3. In what shape did your bees go into winter quarters?
4. What is the outlook, pasturage, for next year?
5. How many bees do you expect to have in 1919, compared to 1918? Do you expect to make much increase?

HONEY ON HAND

A striking characteristic of answers to this question is that there is relatively little honey left in the hands of the producers, and what is left is generally being held to be sold out piecemeal to the local markets. Some of the lots on hand and prices expected wholesale are as follows:

1,500 pounds Connecticut extracted at 30 cents.
One ton Kentucky at 25 cents.
12 barrels Alabama at 25 cents.
12,000 pounds Colorado at 23 cents.
240 gallons Louisiana at 20 cents.
18,000 pounds Michigan at 27 cents.
12,000 pounds Colorado at 25 cents.
5,000 pounds Colorado at 27 cents.
75 cases Utah at $5.00.
10,000 pounds California amber at 22 cents.
1,200 pounds California white at 24 cents.

It is evident from these reports that practically all beekeepers were able to get satisfactory prices for their honey. In fact, very probably the dealers are well stocked up with honey and wondering just what the market will do.

The fact that the War Trade Board has removed the restrictions on honey imports, lets in large quantities of Cuban and West Indian honey which has been seeking a market.

This has had an especially bad effect, since it has been very hard to export honey as yet, owing to the restrictions of the same War Trade Board. But we have just received a wire (Dec. 19) from the Board in answer to ours, stating that all restrictions on honey export are removed December 20, and that after that date honey may be shipped to Canada, Great Britain, France, Italy, or their colonies without individual export license.

MOVEMENT OF HONEY

In the local markets honey is going very well, where the beekeeper has any to furnish. In fact, the local markets are not being furnished to any extent except as honey is sent in by the big bottlers.

In the larger markets and with wholesalers the demand seems to be slack. This is mostly due to the signing of the armistice; and also to the shipping in of West Indian honey in competition with that of the States.

Foreign markets are still bare of honey and the demand good at high prices, so that in the course of a few weeks, when shipping becomes easier, there should be no trouble in getting satisfactory prices by means of exporting. There is no doubt a feeling of uneasiness on the part of the jobber as to just what the market will do, but we do not see how prices can drop very much before the next crop comes in, as there is such a small amount left in the hands of the producer. Our idea is that the market will stiffen just as soon as shipping space becomes a little more easily available.

SHAPE OF BEES FOR WINTER

In reading the reports coming in I have been struck with the number stating that their bees went into winter rather light in stores, especially in the eastern and central States. This is due to the fact that the fall crop was small in most localities, and to the difficulty of getting sugar. In most cases there is combined with this a shortage of bees in the hives, also due to the same cause. This may mean rather severe losses during the winter. Starvation will especially be a danger, since bees are apt to use more honey in such a mild winter as we are having so far.

The sugar restrictions are now removed, and it behooves every beekeeper who has colonies lacking stores to make the loss good either as early in spring as possible, or yet this winter by feeding sugar candy (properly made).

Most reports indicate that bees went into winter quarters in good shape, a few from the northwest also indicating light colonies.

PASTURAGE OUTLOOK

Pasturage outlook is better than a year ago, a comparison of reports for the two years shows. It is early to base conclusions on pasturage outlook now, especially in the western States. But the east and most of the central States have had good fall rains, which has put clover in fair to good condition to survive the winter.

The prospects in California seem to be better than a year ago. There have been a number of early fall rains and the weather is seasonable, all tending to a better outlook for the honey plants.

It is in Texas, however, that prospects show the greatest improvement over a year ago. Bountiful fall rains have not only made good fall flows in many localities, but they have started the vegetation throughout the State and beekeepers are hoping for a return to normal conditions after some of the worst seasons they have ever experienced. One or two reporters state that it will take two or three years to replace all the perennial plants and shrubs which have been killed out by the drought of the bad seasons.

BEES IN 1919

Practically all losses of the winter of 1917-18 have been made good by increase during the past summer, except in the State of Texas, where it will take another summer to place them back to where they were before the bad years came, and this deals alone with the commercial beekeepers. It will take much longer than this to make up for the losses on the part of the smaller and amateur beekeeper.

The whole country over, there are, without doubt, more bees than a year ago.

Nearly all reports are to the effect that there will be some increase made during the coming spring, this increase ranging from just enough to make up losses, to 100 per cent, the most of the reporters stating that they would make from 25 to 50 per cent increase.

The largest beekeeper in the southwest expects to increase his holdings from 7,000 to 10,000 colonies, while another in the mountain States of the west will increase from 5,000 to 7,000 colonies. The latter beekeeper, by the way, raises his own queens, having a queen breeder whom he pays at the rate of $8 a day to do the work.

BEES AND QUEENS FOR NEXT YEAR

With very few exceptions, beekeepers have very little doubt but that they will be able to secure all the bees and queens they will require. Several have made contracts or placed orders in advance for their season's requirements. Many more are increasing solely by division, while others do not expect to have to requeen till late sumer, when the demand for queens is not so great.

AMERICAN BEE JOURNAL

VOL. LIX—NO. 2 HAMILTON, ILL., FEBRUARY, 1919 MONTHLY, $1.00 A YEAR

THE CALIFORNIA SHORT COURSES

An Account of the First Extensive Series of Short Courses Designed for the Commercial Honey Producer

THE State University of California, in co-operation with the U. S. Department of Agriculture, has recently undertaken a novel experiment. The success of the enterprise is a source of gratification to all concerned, and it is doubtful if the most loyal booster was prepared for the enthusiasm which developed.

A short course in beekeeping is not a new thing, in fact the writer has attended several of them in various places. The California short courses differed from others previously held, in that they were planned entirely for the benefit of commercial honey producers instead of beginners. Every other course so far held, as far as the writer has observed, has been elementary in its nature and designed especially for the novice. There seemed to be some doubt as to whether the attendance would justify a course designed for the experienced beekeeper. In order to place the course within reach of all California beekeepers, a series of four were decided upon, to be held in widely separated locations, each a full week in duration.

The first was at San Diego, in the extreme southern part of the State, beginning on November 25. This was followed by one at the University farm, at Davis, in northern California, beginning December 2. The next was at Visalia, about 200 miles south of Davis, held the week beginning December 9. The fourth and last was to have been held at Riverside, in the heart of the orange belt, but was prevented by a quarantine established by the board of health to prevent the spread of influenza. Since more extensive honey producers live within reach of Riverside than any other point, it was confidently expected that the Riverside meeting would be the biggest of all—the grand climax of the series. The quarantine came as a bitter disappointment, not only to many beekeepers who expected to attend, but also to those who had been responsible for the series, and members of the staff, who looked forward to the opportunity of meeting the beemen at that place.

Considering the fact that an epidemic of influenza was raging all over the country, and that the ban was only lifted the week previous to the San Diego meeting and clamped down again the last day, it seemed very fortunate that even three of the courses could be held. In view of the number that undoubtedly remained at home because of the epidemic, the attendance was very gratifying. At San Diego there were something like 100 in constant attendance, with a total attendance of probably 150 persons.

The Course

The course given was the same at all of the places, and the same program was followed from beginning to end, with slight variation. Instead of starting out with elementary instruction in such matters as hive construction and methods of manipulation, it was assumed that those in attendance were beekeepers of experience, familiar with hives and other equipment, and understood fully the meaning of such words as "top-bars," "swarms," "hive-stands," and "propolis."

The outline was made at Washington by Dr. Phillips and Mr. Demuth, who with Professor Coleman of the University, were the principal speakers. The whole purpose of the course was to lay a thorough groundwork of fundamentals and then apply these to beekeeping practice.

With many beekeepers, what they have learned is a matter of experience. Many of us learned manipulations long before we understood the reasons for them. By considering the first activities of the bees them-

Another Short Course for Beekeepers

As we go to press we have received a telegram from Mr. Demuth asking us to announce that there will be a short course at Cornell University, Ithaca, N. Y., similar to the ones just closed in California. The dates given for the New York course are February 24 to March 1.

We hope that the University will be able to advertise this course widely among Eastern beekeepers and that they will understand that the course is designed for commercial beekeepers rather than for beginners.

Phillips didn't know the camera was loaded.

selves, we can better understand why a particular manipulation is necessary to secure a desired result. At the beginning, the work was divided into two parts, "Fundamentals of bee behavior outside the active season" and "Fundamentals of bee behavior during the active season." The beekeepers' year was thus divided into two parts, the active season, and winter or the inactive season. Following the presentation of the bee activities during these two periods, fundamentals of practice were taken up in similar manner, and the reasons for manipulations were pointed out because of the nature of certain activities of the insects.

One day was devoted to the consideration of the subject of disease, and the same general method of handling the subject was applied. Many came with a very definite idea of the nature of the course, and some were skeptical as to whether it would be worth while. Others seemed to expect something in the nature of a beekeepers' convention.

It was a school, rather than a beeman's meeting or convention, and there was but little time for the usual social activities common to conventions. The sessions started at 9 a. m. and continued till noon. After a brief recess for the noon luncheon the grind was resumed till time to eat again. The evening sessions were attended, in spite of the hard day, and there was no lack of interest, even up to the close of the last session. Note books were much in evidence, and many went away prepared to review the work after returning to their homes.

One very pleasing feature was that the more extensive beekeepers were the most enthusiastic about the course, and most anxious to see it repeated. Many were present who own from 600 to 2,000 colonies of bees. Several had sold honey crops the past season ranging from ten to twenty thousand dollars in value. When men of this kind stick from the sound of the first gong until the last session is over, it is good evidence that the course is extremely practical, and when such men ask that it be repeated again next year, there need be no fear that the instructors have wasted their time. There were a number of beginners present and they stuck heroically, although much of the time they did not understand fully what was being said. They absorbed some of the enthusiasm of the old timers and picked up pointers here and there, which were sufficient to sustain their interest to the end. A few staid for only a day or two and then disappeared, but most of them remained and expressed themselves as sorry that the course was not longer.

Mendleson in action at the Davis short course.

The Staff

The greater part of the work was carried on by the men of the U. S. Department and of the University, as would be expected. Others were invited to speak on special topics. Dr. E. F. Phillips, as Government apiculturist, occupied first place on every program. Phillips is a forceful fellow, an easy speaker, and holds his audience without apparent effort.

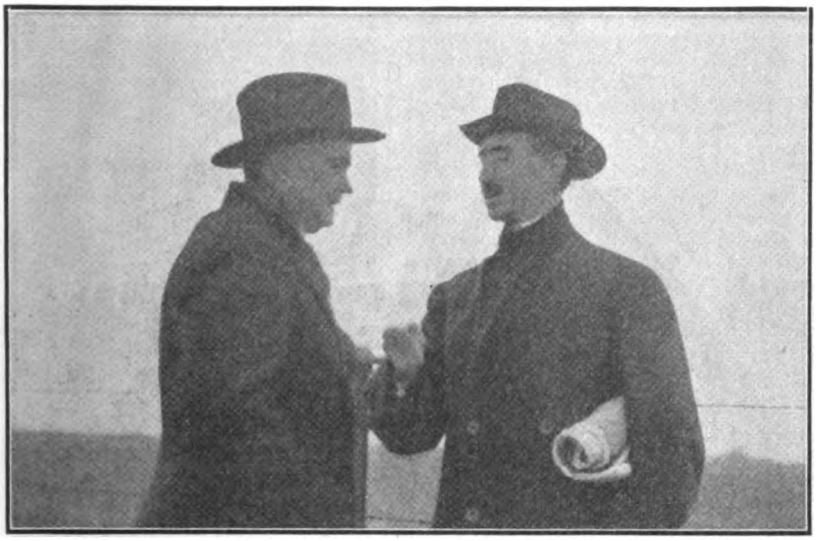
George S. Demuth, assistant apiculturist, divided the heavy work with Doctor Phillips. Demuth is a practical beekeeper of long experience who went into government service about seven years ago; the opposite, in many ways, of Phillips. The two did some great team work. Each reviewed the work of the other at the end of the course and with nearly every subject one would consider the scientific phase of it while the other made the practical application. It is very fortunate that they are able to supplement each other so nicely. Demuth is an extremely practical man with many years of beekeeping experience. Those who saw him in action during the course were much impressed with the character of his work. Some went so far as to say that he is one of the greatest teachers of beekeeping of the generation.

A third Department man whose name was not announced on the program but who, nevertheless, made an important contribution to the work, is Jay Smith, the well-known Indiana queen breeder who is spending the winter in special extension work for the Department, in the State of California. Mr. Smith gave some very interesting talks on queen rearing.

Mr. George A. Coleman, Apiculturist of the University of California, had general supervision of the work, in addition to giving some extended lectures with special application to California conditions. Mr. Coleman was so unfortunate as to contract the influenza, and was compelled to go to his home before the close of the first course. He managed to get back to appear at Visalia, but it was very apparent that the attack had left him very weak and that he should not have resumed his work.

Mr. M. H. Mendleson, who is one of the best known among the pioneer honey producers of California, was a constant center of interest wherever he went. Having produced as high

Demuth taken unawares.



Manager Justice, of the California Honey Producers' Association, and Charlie Edson, were so busy discussing honey markets that they did not see the camera man.

as one hundred tons of honey in one season, in California, his word carried weight and everybody seemingly wanted to shake his hand and ask him to help with their particular problems.

E. R. Root, the genial editor of Gleanings, gave some interesting history of the development of the beekeeping industry. He appeared on the last day of the course, after the tension was somewhat relaxed. Anecdotes of Langstroth, Heddon and other pioneers furnished an interesting diversion after the heavy grind of fundamental instruction. Of special interest was his account of the controversy over the size of the hive in the early days when Charles Dadant advocated the large hive, while Hutchinson and Heddon went to the other extreme. Mr. Root paid a tribute to the constancy of the advocates of the large hive and was free to admit that a larger brood-chamber than that furnished by a single-story 10-frame hive is necessary for best results.

Frank C. Pellett, associate editor of the American Bee Journal, discussed the subject of bee inspection. As State Inspector for Iowa for a period of five years, he has been through the mill and tried to present the subject from the standpoint of practical protection for the beekeeper. He outlined the difficulty of getting results by the quarantine method, after a disease has been widely distributed. He outlined the difficulties of an inspector and pointed out possible dangers through improper methods of law enforcement. The substitution of educational for police methods was recommended as more likely to secure satisfactory results.

Sidelights on the Courses

Thanksgiving day came during the San Diego meeting and it was feared that most of the beekeepers would go home to celebrate the day and leave the staff to themselves. Not so, however, for although the attendance was not quite up to the high day, it was very good for every session.

To celebrate the end of the war and to give a grand finale to the training of the boys at the aviation field, a great display of Uncle Sam's flying craft was given one day during the short course; 212 machines were in the air at one time in battle formation. There has probably never been a larger number of airships flying together at any place outside the battle zone. The boys performed all kinds of stunts for the amusement of the crowds watching from below, and not an accident was reported to any of the machines. One youngster frightened scores of people terribly by throwing overboard a suit of overalls. As the garments turned over and over in the air many people thought that they were witnessing the final act in the career of some daring flyer.

Of course it was impossible for any speaker to talk beekeeping in the face of such competition as was offered by the flyers, so the session was adjourned for about an hour during the flight, but was promptly resumed when it was over.

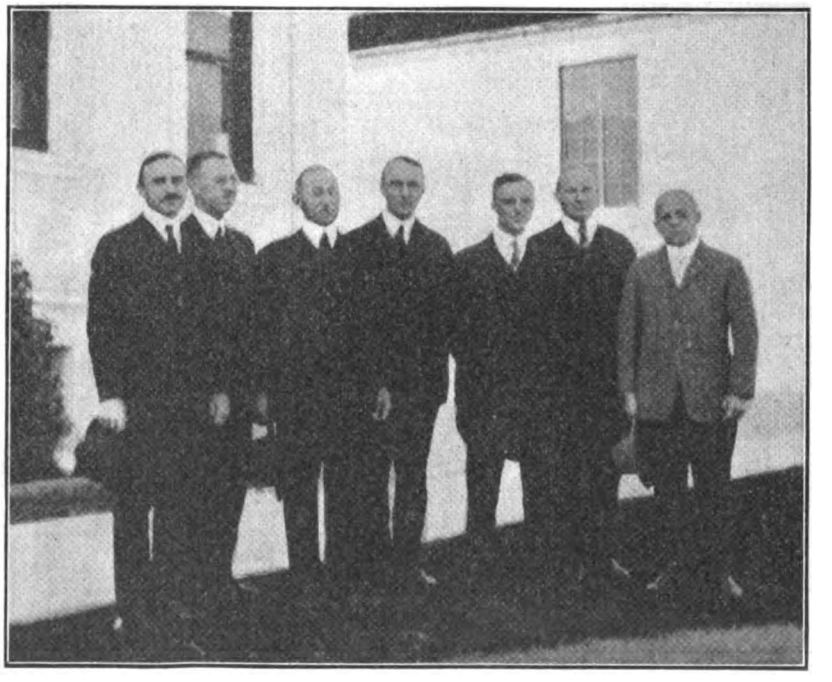
The San Diego short course was wedged in between two "flu" bans by the merest, scantiest possible chance. The ban was raised at the end of one week, the sessions began on Monday and the ban was clamped down again on Friday night at midnight, thus cutting off the final day's sessions. Many had failed to get the word, so gathered outside of the hall for final goodbyes. Since Editor Root had not yet appeared at a regular session, the crowd sat on the steps of the hall and listened in the open air, to the speech which could not be given inside because of the regulation of the board of health.

Doctor Phillips thought that they served us well at San Diego, having raised the "flu" ban for the week, declared a National holiday (Thanksgiving) and given the greatest display of aeroplane activity in the nation's history.

No account of the San Diego meeting is complete without some mention of the hustling County Agent, H. A. Wineland, who presided at the various sessions and to whom much credit should be given for the success of the course. Everybody in the county, whether a beeman, raisin grower or just a plain hobo, seems to be strong for Wineland. He knows everybody and is constantly on the job, no matter whether it is beekeeping, orange growing or rabbit hunting that is under consideration.

It is a long trip from San Diego to Davis, near Sacramento, in northern California. The journey requires nearly 24 hours of travel, and gives one an idea of what a tremendously big State California is.

At both Davis and Visalia, trips were made to nearby apiaries, and part of an afternoon spent with the bees. There were informal discussions of various things of interest to



The Staff

beemen and some demonstrations of pet hobbies.

The limits of space for this article have been reached and the half has not been told. There is no room left for the various incidents by the wayside, the visits to fig orchards and raisin-packing houses, by members of the staff who slipped away with Mr. Hawley; of the way they tricked the writer into sampling fresh ripe olives, of a dandy trip to the orange groves with Mr. Darnell, of the many things of interest to the tenderfoot from the east to California in winter, or of the dinner parties, visits, nor the delightful midnight talkfests by groups of beekeepers who should have been in bed. We hope to find room for some of these things in connection with other articles about California beekeeping, but many must remain untold.

California gave the lie to the oft-repeated excuse by university authorities in many States, when approached by beekeepers asking that educational work be undertaken in beekeeping. They say "There is no demand for work in that line." There has been no opportunity to demonstrate a demand. The California University is to be congratulated upon being the first to offer a comprehensive series of short courses to commercial honey producers. The California beekeepers are to be congratulated upon the magnificent way in which they have taken advantage of the opportunity, thus demonstrating that, for a practical course, there is a real demand. The total attendance of the three meetings was between three and four hundred persons and would have been larger, but many had expected to attend at Riverside, which meeting was cut off. Under normal conditions the total would have probably been above five hundred at the four places.

With so much enthusiasm shown for these courses, we may reasonably expect that other States will offer similar ones, and since these are successful, we hope that Doctor Phillips and his staff will be encouraged to make similar co-operation a permanent policy of the Division of Apiculture.

An outdoor demonstration at one of Oliver Park's apiaries, near Davis, during the short course.

Group of beekeepers at the San Diago short course.

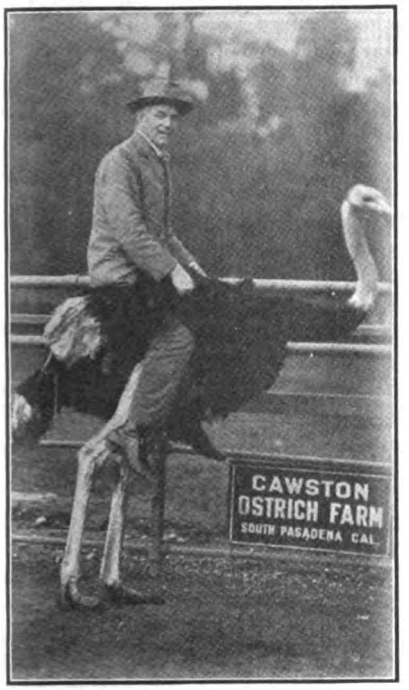
Force or Education

By Frank C. Pellett

A STUDY of the inspection laws of the various States brings to light some remarkable conditions. At the close of the world war, when the attention of the American people has been called to evils of old world administration, it may not be amiss to examine the tendency of our own country to drift toward autocratic methods of government. In passing laws relating to bee diseases, we have been so frightened by the presence of disease that we have put more power into the hands of the inspector, as far as our business and property are concerned, than it was ever designed that any one individual should hold, under our American institutions. It is a serious question whether we have not gone entirely too far and whether it is not now time to call a halt.

We are living under a constitution which gives to every man the right to be heard and provides that no individual shall be deprived of his property without due process of law. Nevertheless, many States have passed laws which place the property of the beekeeper entirely in the hands of the bee inspector. These laws make the inspector the sole judge as to whether or not disease is present and give him authority, if in his judgment it is necessary, to destroy the property of the beekeeper without restraint. Under such a law, healthy colonies of bees may be destroyed with no protection for the beekeeper. A little study of the situation will make it apparent that the beekeepers have become so aroused over the presence of disease that they have caused the enactment of laws which might easily become a more serious danger than the disease which they are designed to control. Many of these laws go so far as to give the inspector authority to establish a quarantine against the sale of honey from infected areas. The danger of spread of disease through the sale of honey in the ordinary channels is so small as to be negligible, yet is is easily possible for a misguided inspector to ruin the beekeepers in a large territory. In no other department of American activity do we make it possible for one man to judge the merits of a case, assess the penalty and finally execute the sentence.

The time has long passed when quarantine methods were advisable



Jay Smith on a "Seeing California" excursion.

in dealing with foulbrood. When the disease was confined to a small territory it was reasonable to expect that its spread might be checked by establishing quarantine against infected areas. Now that it is present in probably every State in the Union, little is to be accomplished for one infected State to establish a quarantine against another infected State. There should be laws to govern the movement of diseased apiaries, as a matter of course, but they should be administered in the same way as other laws. Hog cholera is a serious animal disease which the farmers of America have good reason to fear. Yet there is no general provision which makes it the business of a State to examine all the hogs at stated periods and destroy every herd where disease is found, nor yet to give the owner a certain period in which to treat them. Now that cholera is widely spread and generally to be reckoned with, it is thought that the owner's financial interest in the hogs should be sufficient incentive to give the matter his attention.

The writer has had five years' experience as a bee inspector and knows something of the impossibility of getting results under existing laws. In the first place, it is a practical impossibility to examine all the bees in a locality in the thorough manner necessary to establish the presence of disease in every case. If bees are examined in such a manner, there is no time left to give their owner assistance or instruction in dealing with the disease, and the chances are good that, without previous experience, if he tries to treat them, he will only make a bad matter worse and spread the disease still further.

If, instead of coming as a policeman sworn to compel the owner of every diseased colony to cure or kill, the inspector came as a demonstrator to assist the owner in treating his bees, he could be of far greater service. A policeman is only called when you have committed a crime or are suspected of malicious intent. As a consequence, nobody likes to see a policeman about. The poorly-informed beekeeper is immediately resentful when the inspector comes into the apiary and marks the colonies to be treated. If the inspector had no police authority, but came as an educational officer, he would be welcomed and his work would be far more effective.

The question of results has been discussed with many of the most successful inspectors and all have been disappointed in what they have been able to accomplish under these laws. Almost without exception they state that the principal value of their work is in the assistance they have been able to render by instructing the inexperienced in the treatment of disease. This being the case, why not make the office a purely educational one and leave the enforcement of such law as is necessary in the hands of others.

The legislatures are now in session in several States and in some the beekeepers are considering the matter of protection. Let us warn the beemen in these States that they are better without any law at all than they would be with the stringent provisions now on the books of several States. Some States have abandoned the stringent quarantine laws after a trial and other States are considering how to get rid of them. Where new laws are to be passed it is far safer to make a move toward an educational officer rather than toward another policeman.

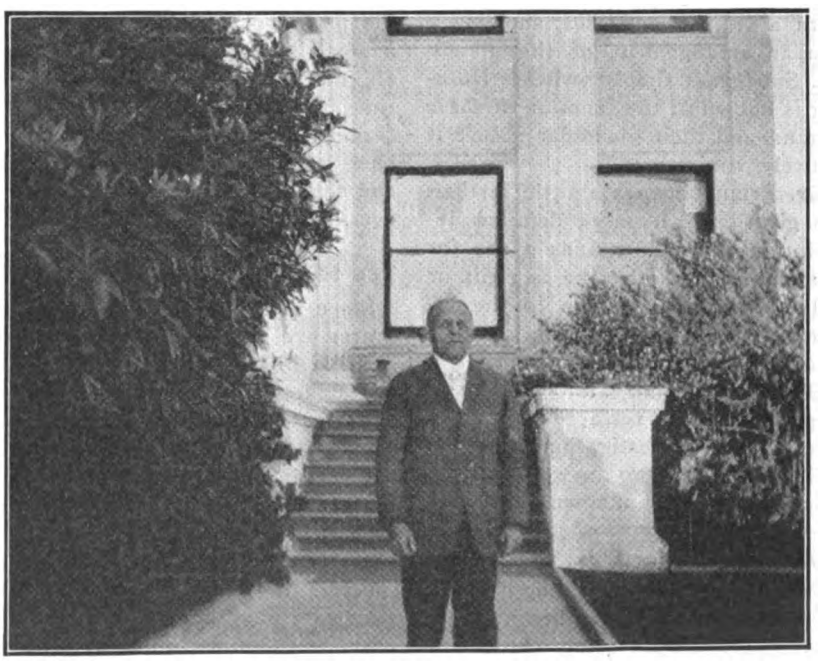
Probably Morley Pettit, in Ontario, was the first to utilize the apiary demonstration as a means of checking bee diseases. By holding a demonstration in an accessible location, it is possible to reach a large number of persons and to give each one practical instruction in diagnosis and treatment of disease so that he can go home and apply it to his own apiary intelligently.

A quarantine is never effective unless it is thoroughly done, and the money available in any State is seldom sufficient to cover 20 per cent of the territory. What does it profit to burn up one man's bees and leave a similar condition across the fence untouched? While the inspector is examining all the bees in one large apiary and marking those to be treated, he might have given a group of two dozen persons careful instruction in how to inspect their own apiaries and treat their disease.

We can only judge a system by its results, and by this standard the quarantine method has certainly been a failure. There is more foulbrood now present in many States than there was at the time the most stringent laws were passed. If the system has proved a failure why not admit the fact and try some plan that gives better promise of success?

In nearly every State there is an agricultural college with an extension department whose business it is to assist the farmers with every problem. If the beekeepers will strive to get a beekeeper with expert knowledge of disease, into that department, he will be of far greater service to the industry than half a dozen inspectors with police powers. As education increases the necessity for law enforcement decreases. With a proper knowledge of bee diseases there is little occasion for law enforcement.

Please note that it is not proposed to do away with all law or force, when necessary, but it is proposed to enforce bee laws exactly like other laws and make the inspector an educational officer.



Prof. G. A. Coleman, of the University of California.

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language. Consolidated with The National Bee Journal in 1874.

Published monthly at Hamilton, Illinois.

Entered as second-class matter at the postoffice at Hamilton, Illinois.

SUBSCRIPTION RATES—In the United States and Mexico, $1 per year; three years, $2.50; five years, $4. Canadian postage 15 cents, and other foreign countries 25 cents extra, per year.

All subscriptions are stopped at expiration. Date of expiration is printed on wrapper label.

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THE EDITOR'S VIEWPOINT

Our Cover Picture

We are reproducing a cover picture which we used several years ago, because it is a characteristic view of a California apiary. The background of mountains is familiar to every visitor to the Golden State. The series of short courses in beekeeping has brought California prominently to the attention of beekeepers everywhere just now.

Microscopic Studies

In this number, Dr. Brunnich, of Switzerland, gives us some very interesting microscopical studies, with an opinion concerning the use of the organs described. The description of these 6 glands, in the rectum, is not entirely new, as it was given on page 106 of Dr. Snodgrass' famed work, "The Anatomy of the Honeybee," with a cut, on page 103, showing a similar arrangement of the glands. Dr. Snodgrass simply writes: "Nothing is known of the function of these organs, and their glandular nature is entirely conjectural."

Dr. Brunnich goes a little farther. He gives a little more detailed description and boldly finds a use for the glands. Whether he is right or not, our thanks are due to the investigator. Every day the advance into the problems of nature goes a little farther and, although many steps have to be retraced, it is only through such investigations that we will continue to go forward in the immensity of the unknown.

Save Your Bee Journals

There is an ever-increasing demand for back numbers of the bee journals by students of beekeeping who desire to complete their files. There is a wealth of valuable information in the back issues which is of every-day value to the beekeeper who will make use of it. In every number are valuable articles which do not seem to be of immediate interest, and the only way to make the most of such matter is to preserve the periodicals for future reference

Preserving Royal Jelly

To provide a supply of royal jelly at the time of starting a new lot of queen-cells is sometimes a problem to the beekeeper. There are times when extra queen-cells are present in considerable numbers, so that an abundant supply could easily be secured for future use. J. W. George, of ElCentro, Calif., informs the writer that it is an easy matter to preserve royal jelly for a considerable period of time by placing it in a small bottle and corking it tight. He often keeps it for weeks at a time in this way. He finds that jelly that is slightly hard is easily softened by diluting slightly with water and that it is apparently as good as ever.

Too Much Law

Since the legislatures of many States are now in session, the usual grist of bills relating to all subjects are under consideration. There is entirely too much ill-advised legislation, and legislation relating to beekeeping is no exception to the rule. In this issue the associate editor has an extended article, the result of five years of experience as a State bee inspector. Beekeepers should consider very carefully the possible result of improper administration before asking for stringent laws. In some States where good results are now being secured because the officials in charge are sensible men, it would be possible to paralyze the whole industry should an incapable man be placed in charge. It is dangerous business to centralize too much authority in one man.

In almost any line better results can be secured by education than by force. The short cut to eradication of foulbrood is by educating the mass of beemen in the proper treatment. One good teacher is worth a dozen policemen. Get after the extension departments of your agricultural colleges to put expert beemen in the field.

Are Queens More Prolific Than Formerly?

In the December number of Gleanings, page 725, A. C. Miller states that he prefers the deeper Jumbo frame to the regular Langstroth and gives as one of the reasons that "our queens have outgrown our present hives." Well, that may be the case in some instances, but we wish to state emphatically that, for 50 years, we have found **our** queens capable of filling the brood-combs of the large hives.

True, we have often found some queens that were incapable of doing this; but we have considered such queens inferior. The queens which we use at the present day are purchased from southern breeders; the queens of the old days were of our own breeding, all Italians, of course. We are very much of the opinion that the large, deep frames are the main cause of the difference in breeding results with others. Greater ease in finding cells secures more speed in laying and apparently greater prolificness. Give your queens a chance.

Beekeeping in Chile

Since the attention of our people is more than ever drawn to international questions, it may be interesting to learn how the honeybees were first introduced in Chile.

We understand that bees were brought to the North American continent by the Spaniards, in Florida, previous to 1763. They were the common black bees of the European continent, but we know nothing of the men who brought them. Not so with the importation of bees into Chile. This was not done until 1844, when Don Patricio Larrain Gandarillas bought, in Milan, 50 colonies of bees

in boxes. He succeeded in packing and shipping only half the number. But these were all lost in transit, owing to long delays.

A little later, in the fall of 1844, another man agreed to try bringing the other 25 colonies. His name was Don Carlos Bianchi, and he succeeded in bringing alive two weakened colonies out of this lot. After landing these bees at Valparaiso, they were finally placed upon the farm of the Senor Larrain, at Penaflor. The following spring, the tenant of the farm was very much astonished at two occurrences which he did not understand. The two colonies cast each a fine swarm, and beekeeping was thus established in Chile. The race of bees would have been pure Italian if other immigrants had not succeeded in importing also the common bees. So the bees of Chile are a mixed race, better than the common bee of Europe, but of less value than those of Italy.

The above interesting information was gleaned from the book "Colmenas I colmenares" (Hives and Apiaries) of Don Carlos Echeverria Cazotte, published a few years ago, in Santiago De Chile.

A Winter Problem in the South

Beekeepers living in the Southern States often complain that too much space is taken up with discussions of wintering, a subject in which they are not interested. After visiting in most of the Southern States it is very evident to the writer that there is a serious winter problem in every Southern State. It is true that it is a different problem from that presented to the northern man. In the south it is largely a question of conservation of bees and stores. Bees will live through without extra protection or care, but often the colonies are too weak to profit by the early honeyflows. In California many beemen make it a practice to extract their honey too closely in the fall, with the result that the bees are not strong in time for the orange flow and a possible crop is lost. An extra super of honey left on the hive will often bring several hundred per cent in returns the following spring.

Southern beekeepers may not be interested in employing the methods used in wintering in the north, but if they will read the wintering articles closely, they can often find principles discussed which may be applied with profit to their local conditions. It is safe to say that nowhere in America is there a locality where the beekeeper cannot study the wintering problem with real profit. Not all of wintering consists in getting the colonies through alive, but rather in bringing them to the first honeyflow in condition to make the most of every day when nectar is available.

Do Bees Get Honey From Corn?

There is some controversy as to whether the bees get honey from Indian corn or maize. We have frequent reports of honey from this source, yet some observers contend that the beekeepers are mistaken, and that the bees get only pollen from corn. However, some contend that the bees may be seen at times, gathering pollen from the tassel, while at other times they work on the silk from the ear and are apparently getting nectar, but no pollen. It is known, also that at times plant lice or aphids are present on the stalks and the question arises whether the bees do not get honeydew from these plant-lice.

So much has been said on the subject that we are very anxious to settle the question fully and we will accordingly very much appreciate the favor if any beekeeper who has made observations along this line will write us what he has seen.

Snow About the Hives

This is an uninteresting subject for those of the American Bee Journal readers who are scattered along the Pacific Coast or who live in the Southern States. But it is a very lively question for the Middle and Northern States during January, February, and often March. What to do with the snow? Leave it about the hives and over them?

For a number of years, in my younger days, I feared that the snow covering the hive entrances might smother the bees. So it was customary with us to remove it from the entrance as promptly as possible after it fell.

One winter, a few days after a very heavy drifted snow-fall, I happened to call on a friend who had a dozen colonies, more or less, ranged along the sheltered side of a very high fence. My mention of the possible smothering of the bees that were under the snow gave him at once some anxiety. He and I walked to the apiary, where nothing denoted the presence of hives of bees except a slight wave in the appearance of the snow-drift over each colony. We dug the snow away in front of the first hive and soon found that the colony was alive and well, having melted the snow away from the entrance a few inches, through the natural heat of the bees, evidently. This made one feel as if the "igloo" of the Eskimo might not be a cold winter home after all.

The other colonies were therefore left to shift for themselves under their snow blanket. But here comes the other side of the picture:

Some time later a thaw came and the snow began to melt until a hole about 4 or 5 inches in width appeared in the snow-drift before each hive. The warmth induced the bees to issue, and large numbers of them died in this passage, in front of some of the hives. Those colonies were in bad shape when spring came.

Ever since that time we have considered it a very favorable condition when there was snow enough to cover the hives with it, or at least to thoroughly shelter them against winds. But whenever mild weather came, we carefully and as noiselessly as possible, removed the snow from the entrance. Melting snow which runs into it makes a very disagreeable condition for the bees that wish to take a flight, besides the danger of its freezing and making a cake of ice where the air should enter.

When bees take a flight, in mild weather, we found it very unadvisable to try to keep them confined. We have wide roofs over our hives and usually turn them over in front of the entrance for an alighting place. A little straw, or some sawdust, or coal ashes, scattered in front of the hives, helps them in finding a footing where they may not be chilled.

Prepare to Stimulate Your Market

With the harvesting of another crop, the world shortage of food can be expected to be somewhat relieved. A fall in prices will be a natural result of this condition. Beekeepers are now enjoying such prices as they may never see again. However, by judicious advertising of our product we may well expect to maintain the price of honey at a profitable point. It stands the beekeeper in hand to begin his advertising campaign before a smash comes. Good printed matter, attractive packages, and many other suggestions can be used to stimulate the interest in honey as a food product.

DEEP VS. LANGSTROTH FRAMES

A Discussion of the Two-Story Brood Chamber as a Substitute for Deep Frames

BY C. P. DADANT

The following question is representative of those reaching the editor following the appearance of the article on large hives in the November number:

"I am interested in the discussions regarding size of hives, in the Journal. I started beekeeping with eight-frame Langstroth hives, some half dozen years ago, but soon finding them too small have changed completely to the ten-frame. Now I am convinced that a single body ten-frame Langstroth is too small to contain the bees and sufficient stores to winter several of my best colonies.

"My hives, however, are new double-walled, so I dislike to incur the trouble and expense of changing. What would you think of increasing the size of my brood-chambers when there seems to be need, by placing a half-story with shallow frames on the present brood-chambers, to remain permanently, winter and summer? Place on this the queen-excluder, obtaining my surplus above?

"Of course there would be a little more difficulty in inspecting the brood-chamber, but this doesn't seem to me serious. My chief question is, would the bees fasten the upper frames to the lower ones, or would the break in the continuity of the brood-chamber by the two sets of frames interfere with brood rearing or be in any other way serious?

"Will you, through the American Bee Journal, kindly give me your opinion, with any suggestions?"

D. C. P., Massachusetts.

In giving prominence to large brood-chambers, in our November number, I did not intend to start a series of articles on the subject. But it seems to be a question of popular interest, as shown by the above letter and a dozen or so of similar enquiries, of which this is a fair representative. The matter has also been discussed, I am told, in the California meeting.

Perhaps the best reply I can give should include an account of my own experience in years past.

About 1876, we undertook the care of an apiary of 100 colonies in 10-frame Langstroth hives, for an old beekeeper who felt unable to look after them. In the same outapiary we kept a few of our large hives. Before the fruit bloom was ended I noticed that the queens, in several of the Langstroth hives, were crowded for room. The bees were making preparations for swarming. So we gave them each a half-story super of the kind we use for extracting, thinking the bees would put the honey in them and leave sufficient room for the queens below. But the queens at once ascended into those half-story supers and filled them with brood. I suppose that some of our small-hive beekeepers would say that this showed the need of queen-excluders. It did, if we did not care to give the queen all the room that she could occupy. Very evidently this was the thing needed, for in none of the large hives did the queens ascend into the supers. In fact those large hives did not need the extra space until later.

The story-and-a-half hives thus made proved very populous when the crop came. I do not know just how much difference the spaces between the two stories caused in the laying. On this matter, opinions differ. The Danzenbaker hive, which has been so much praised and which is formed of two shallow stories, is being abandoned by many of its original adherents, I am told. Perhaps one of the objections to it is this space which cuts the brood apartment in two and compels the queen to walk about when she loses the thread of her regular laying, which, as we know, is most usually in a circle. However, that extensive beekeeper of Texas, Louis Scholl, who is now editor of the Beekeepers' Item, uses sectional hives altogether and derides the suggestion that those spaces are objectionable. Although few of his neighbors in Texas follow his lead, I see that it has made some proselytes in France.

Right here, Mr. Pellett, our associate on the American Bee Journal staff, calls my attention to a fact which has some bearing upon the the greater or less ease with which the queen can get over the space between two stories. In the old days, when the thin and narrow top-bar of the brood frame was in general use, the two-story brood-nest was more practical than it is now. Thick and wide top-bars were adopted because they help in preventing the building of much burr-combs between the stories. The thicker and wider they are, the more difficult it is for the queen to find the other story and continue her laying.

Mr. Pellett asserts that when a two-story brood-nest is used, the queen will readily enough go up from the lower to the upper, but seldom returns again, especially if there are other supers above to which she can go. He finds others with similar experience.

The thick top-bar often so effectively divides the two stories that swarming is aggravated and there is sometimes serious difficulty in getting the queen to return to the lower story, unless she is driven there accidentally in opening the hive. The large brood-chamber avoids this difficulty.

When thin top-bars are used, and especially if they are not of the broad kind the bees build many brace-combs. This efficiently connects the two stories and enables the queen to go back and forth more readily. Probably the difference in results between beekeepers, as to the ease with which the queens go back and forth, is due to some such condition, very easily understood.

Burr-combs are not of much importance, except in the annoyance they cause in handling the different stories. With large brood-chambers, wide top-bars may be used which do away with much of the burr-comb.

The main objection to the storied brood-chambers comes for winter.

At the Richardson apiary during the Visalia short course.

But a story-and-a-half hive would very probably be better for winter than the shallow Langstroth hive. It would contain more honey and more bees. The additional possible loss of heat may be made up by greater ease for the bees to reach the center from the outer edges. If the beekeeper wishes to make up for the exiguity of his hives, without changing their style, this may be a fair remedy. I have never tried it for winter.

However, I insist that, if we wish success in every way, plenty of breeding room, a compact brood-chamber which will not cause the queen to go about hunting for empty cells, protection against excessive swarming, no brood in the upper apartments without excluders, the deep brood-chambers for brood and shallow supers for honey are preferable to a story-and-a-half or to a number of shallow stories, especially in our climate of hard winters.

The article of our old friend, Dr. Bohrer, on page 8 of the January issue, in which he relates his conversation with Moses Quinby, concerning the depth of brood-chambers and the quantity of honey above the cluster, in winter, described in a clear manner the difference between the deep and shallow brood-chamber, when the bees are confined for a long time, in very cold weather. An additional evidence of the strength of this point is furnished by the recommendation of Mr. Demuth to turn the hives on end for winter, as it exemplifies the greater convenience for the bees in having a large amount of honey above the cluster instead of on the side. Similarly I suggest that a large number of shallow frames in a single story is less convenient than a similar surface in deep frames, as it splits the cluster into too many groups. So a Langstroth hive of 13 frames, recommended by some because it makes a square hive, is not so desirable as the deeper Jumbo with a less number of frames furnishing as much space.

However, when the question is to use what we already have, so as to waste nothing, the beekeeper may well hesitate between his ten-frame hives with additional half stories for brood and the Jumbo hive upon upon which he would use his full-story brood-chambers as supers. If I had the choice to make, I would take the latter, for there is no doubt in my mind that bees winter better and breed earlier and more freely in spring, in deeper hives.

Remember that this is not guesswork. Although we do not like the Langstroth frame, we have a number of them always on hand with bees in them, for the demand is for bees in that style, the mass of beekeepers having never yet tried the deeper frames, in this country, and we sell bees often in that style of hives. So we have occasion to pass judgment every year in the comparison of the deep and shallow frames.

May I again insist on the fact that most of the shallow supers in general use are too shallow? We object to handling too many frames, even for supers. The deep Dadant or Jumbo frames are too heavy for ease in extracting; but we do not extract from the brood-chamber. In the super we use a frame which has two-thirds of the capacity of a standard Langstroth frame. Here are the measurements:

Langstroth brood-frame, 134 square inches.

Dadant extracting frame, 92 square inches.

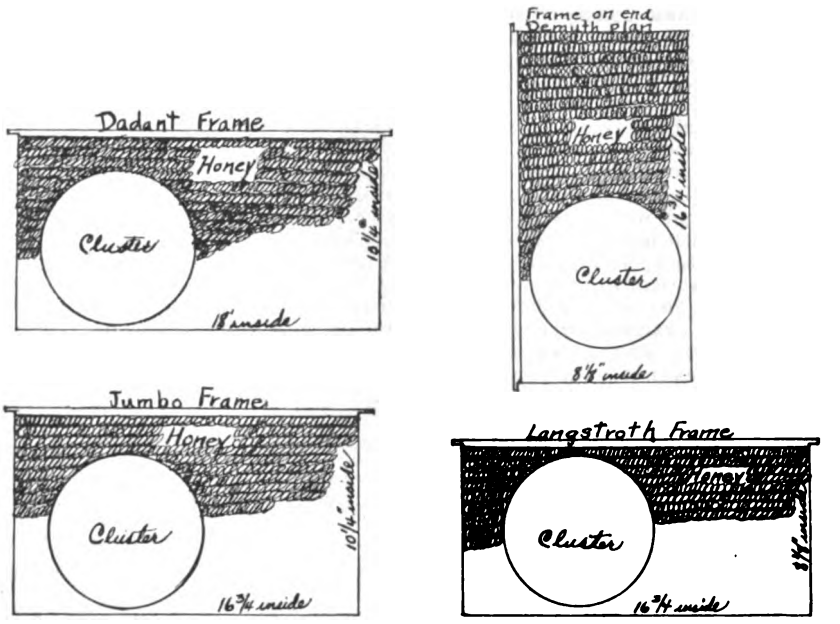
Dadant brood-frame, 186 square inches.

Jumbo brood-frame, 170 square inches.

A serious difficulty of the story-and-a-half brood-chamber is that it gives us 20 frames to manipulate, when hunting for a queen, for queen-cells, for disease, or for any manipulation of the brood-combs.

We have received several letters asserting that even our large brood-chamber is not large enough for the capacity of some queens. That is perhaps true in rare exceptions. It is only an additional argument in favor of large brood-chambers.

I feel very free to discuss this large brood-chamber question, because I have no ax to grind and because I know by my own experience and by that of many who have had similar experience that we have some winning arguments. But I do not wish to urge anyone to abandon the system which he uses, owing to the expense it involves. The matter is not of so deep importance as was the change from the old box-hive system to the movable frame.



The above diagram illustrates comparative conditions, for winter, of the different styles of hive under discussion, with clusters of the same size. The honey of the larger hives being in a less number of frames, there is more of it in each frame and of easier access to the bees. It is important that the honey should be in large proportion above them during the coldest days, when they cannot move in any direction except upwards.

Tribulations of a Beginner

From a personal letter to Dr. Miller

Dear Dr. Miller: A year ago last winter I wrote you asking certain questions, also implying that I expected to get so proficient in the management of bees that I would "at least do as well as the average beekeeper." Now, because you are interested in bees, and further, because I believe you are interested in honest effort I want to tell you my experiences as briefly as I can since writing the preceding letter:

During the winter of 1914-1915 *I* spent a great deal of my time trying to fathom the mysteries of bee literature, and had I not been very dense I would have been better prepared to manage bees in the following spring, perhaps. The spring of 1915 found some 25 colonies under tall hickory trees about 12 rods from our house. My plan was to clip queens and then keep queen-cells removed. When I thought the time was right to clip, I began operations about 9 a. m. and worked hard till I was called to dinner, but could not find a queen. I hurriedly ate my dinner and went at it again, and by supper time I had clipped two queens. The first one I dropped 5 times in the grass before I managed to get her wing clipped. I wonder that she did not fly away in disgust. I learned two things this day, viz.: hives placed in a shimmering light are hard on the eyes and temper, and that my bees were very cross. They would be on the war path for days after opening the hives, and sting so many people that I finally decided to let them alone, only giving them a super when I judged they needed it (by tipping up the back of the hive after dark.) Of course, I had swarms galore and chased to the top of those trees, more than 50 feet high, time after time, till I was so sick of the sight of bees that I would not even look at a fine swarm as it sailed away. As a fitting climax to the season's work, when I came to remove honey I found that eight of the old colonies that I estimated had 50 pounds of

surplus each, now consisted of a disgusting mass of moth-riddled combs. Well, I had some **honey** to pay me for my trouble. Sixteen strong colonies went into winter quarters last fall and they all came out this spring O. K. This time I moved my bees as far from everyone as I could and repeated my efforts of the preceding spring—clip and watch cells every 9 or 10 days, with much better success. By shaking and destroying cells I have had practically no swarming this season. Though the bees were cross, I have examined every colony liable to swarm all the season. One colony was taken to the University of Wisconsin and with the remaining 15 I increased my apiary to 41 colonies (strong) by drawing brood as it could be spared. I raise my own queens for the nuclei. Besides being drawn upon pretty heavily, the 15 old colonies have given me a surplus of about 100 pounds each. As my bees have been hybrids (some pretty black) I have been trying to improve my stock by introducing pure Italian queens. In addition to the 12 queens purchased, I introduced 10 pure Italians of my own rearing later in the season, replacing some of the earlier queens. Perhaps it was poor economy, buying the 12 queens; however, I thought new blood might be beneficial; also, I wanted pure queens in all of my colonies at the opening of next season in order to eliminate hybrid drones and to improve the temper of the workers as soon as possible. I said my bees were cross, also in 1916. Perhaps some might differ with me in judgment; they pestered the horses so badly that my brother was obliged to give up cultivating a field of corn 60 rods away, twice the past summer; though I had not disturbed them for two days previous, and when I did work with them I tried my best to keep peace in their family. However, I finally hit upon a plan that improved matters to a certain extent. As I was protected, I didn't pay much attention to cross bees, and as I left my tools some 30 rods away from the hives, there was invariably a small-sized swarm accompanied me the whole way when my work was through, it occurred to me that I was encouraging my bees to follow people; so I adopted the rule of giving all bees inclined to follow me from the apiary such a smoking that they couldn't see straight. The other plan was to fasten a tin pail to one end of a 5-foot, quarter-inch gas pipe, put some combustible matter in the pail, get a good fire going, leave the pail some distance from the apiary and then encourage the cross fellows to follow by going among the hives (avoiding annoyance by keeping out of the bees' paths of flight), and then give the cross ones a good warm reception.

Wisconsin.

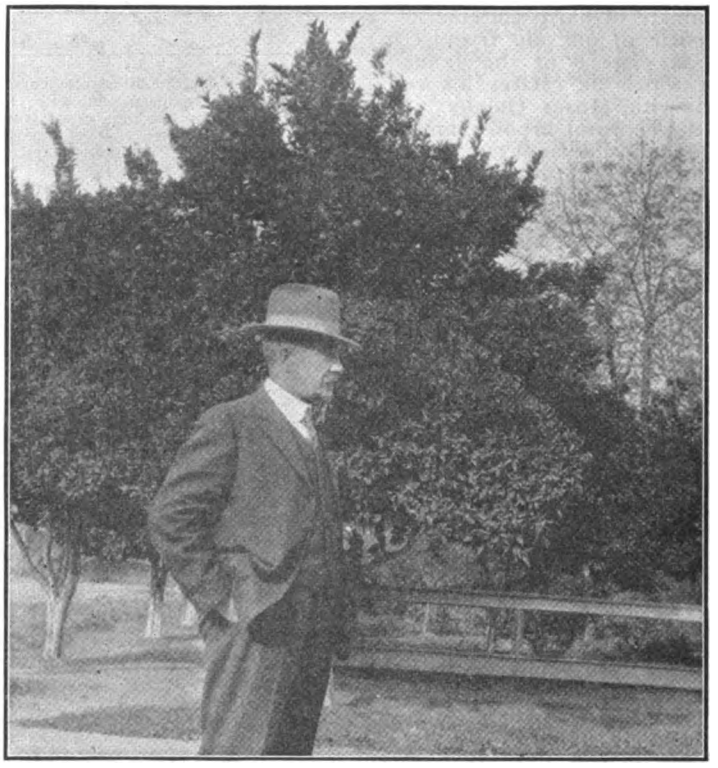
Who Can Answer?

I am wondering if you could not make a suggestion relative to management in this community which would obviate the greatest objection which exists here to beekeeping. We have thousands of acres of fruit trees, largely apple and pear, in this vicinity, which furnish the first flow of honey. These trees are all sprayed with arsenate of lead for coddling moth. Most of the orchardists aim to spray as soon as the blossoms fall. There are no blossoms secreting nectar after the fruit until the locust comes. Arsenate of lead is supposed to have a rather sweet taste and many of the beekeepers have observed that the bees eat this poison when it is put on the trees for the first time and, in consequence, thousands of bees are killed, and very few are kept in the vicinity of the orchards. I am wondering whether some system of feeding for a short period at this time might not keep the bees away from the fruit trees and make it practical to keep bees in the orchard district, where I reside.

Many of the orchards are seeded to alfalfa and in the subsequent spraying a great deal of the arsenate poison falls upon the alfalfa under the trees, but it is claimed by the beekeepers that the alfalfa growing in the shade of the orchards does not secrete much nectar. The largest honey flow comes from the second crop of alfalfa.

H. M. TAYLOR,
Yakima, Wash.

BEEKEEPERS BY THE WAY



A beekeeper on three continents.

A Beekeeper on Three Continents

It is given to but few men to follow beekeeping around the world. W. B. Dickenson, of Chico, Calif., was a beekeeper in England, later in Egypt, and now in California. He has thus had experience in honey production on three continents, Europe, Africa and North America.

As a young man he enlisted in the British army and served for five years, part of the time in East Africa, and ranked as a staff officer when he retired from army service. He was then chosen as government apiarist and sent to Egypt as perhaps the first extension teacher of beekeeping. His field extended up and down the Nile Valley from Alexandria to Kartoum, a distance of perhaps a thousand miles. The Egyptian beekeepers practice migratory beekeeping with their apiaries on boats floating down the river as the season advances. The methods practiced are crude and the time was not yet ripe for teaching of modern methods in Egypt among the mass of beekeepers.

Mr. Dickenson has been in California for several years and is now in charge of the apiary department of the Diamond Match Company of Chico. He has been in charge since this concern established a separate department of bee supplies and they now rank third in volume of manufacture of bee-keeping equipment. Although the Diamond Match line of supplies has only been in the market about five years, it now goes to all parts of the world, and the volume of sales is increasing at a phenomenal rate.

Entrances

By J. F. Diemer

THE article by Arthur C. Miller, in the August number of the American Bee Journal is responsible for the trouble and expense it cost me to devise an entrance that opens and closes like a barn door, on rollers. While Miller's article had more to do with the inside workings of the hive and the appropriateness of a side entrance than with the entrance proper, it gave me the idea of the one shown in the picture. Perhaps this picture describes this entrance better than I could, but I will say that it may be opened to any extent desired, from ⅜x3 inches for winter use, to the full length of the hive, as, for example, when the 15 pounds or more of busy bees, in a 3-story hive are gathering 20 pounds of honey per day, worth 30 cents per pound, and doing this every day for 20 days, and board and clothe themselves, as usual. This would amount to $120 per colony, and 300 colonies would furnish the poor beekeeper almost enough to live, with the present high cost of living, would it not, sir?

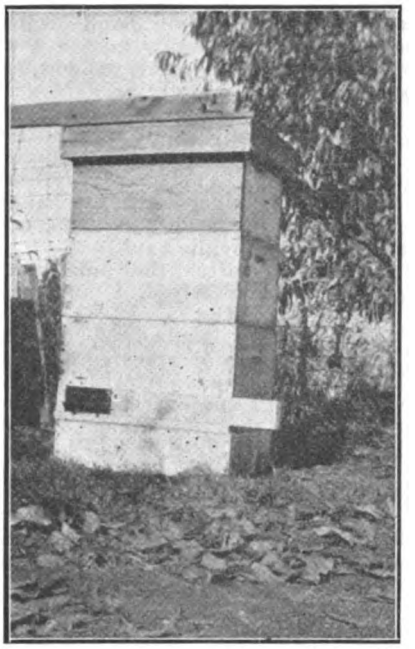
Some folks may doubt this, and I have my doubts, also. But this large entrance, during a large flow, may help to keep a large swarm of bees from coming out when the poor beekeeper is largely engaged elsewhere, and help to solve the swarming problem.

But where this entrance shines most is in moving bees. Just nail on a frame with screen over the broodcombs, using four 3-penny nails, partly driven in, so they will pull out easily. If the bottom-bar is nailed to the hive-body all you need to do then is to push the door shut. Two minutes is plenty to get a colony ready to be moved. Load them on your Ford truck, if you can 'ford to own one, toot your horn and away you go.

The hive shown in the picture, on the 1st of October, contained, by actual weight, 81 pounds of honey, 12 pounds of bees and a good queen. I have 32 here in the home yard, running about the same. They were formed by the "demobilization" of a lot of nuclei.

My bees are well supplied with stores. I left most of it on the hives, on account of the quality. I am just going to make them eat it, and perhaps they will gather better honey next year.

The space between the bottom-board and the frames is seven-eighths of an inch. I don't use the cumbersome alighting board, as I think Miss Bee can fly right into the opening and save walking. Understand that I have used this entrance only since the 1st of October, but it looks good to me. The winter entrance is at the corner of the hive, where I believe it belongs, as the dead bees, in winter, falling near the center of the hive, won't cork up the entrance. Of course this plan ruins the hive-body for anything but a lower brood-chamber, but what's the difference, when the handiness of the entrance is considered? For a hive-stand I use old supers, same size as the hive-body, in length and width.



Diemer's adjustable entrance.

Liberty, Mo.

The First American Fighters in Europe

By a Roumanian now in America

WHILE at a great distance around my home there was not a single flower to be found, as August had closed its shop, a few miles from my beehives there were thousands of trees of blossoming Sophora Japonica.

My poor bees were starving, while over there, not so very far, tons of honey needed to be cared for.

And what fine workers my bees were! Yet the best of them were Americans. I had bought, from the United States, a golden queen. She should have been—maybe she was—a republican, like all these queens and kings we see in this country. She was the finest and noblest queen I ever saw. Her daughters were all like herself, strong, fine, golden, wonderful, hard-working girls. Well, full-bred American girls!

But if they were hard working they were sometimes very hard stinging, too. I had at that time, as pupil, a young peasant, a prospective teacher, who came for a couple of months to work with me in order to learn some of the tricks I used in bee culture. This young fellow came one day, running as mad toward me, crying as loudly as he could:

"Look out, sir! They are after me. Take shelter!"

"What's the matter with you?" I asked, believing he had gone crazy. "Who is after you?"

He howled:

"The Americans are coming. The Americans are after me. Take shelter. Heavens! Where is the water barrel?"

Before I could understand what the connection was between the Americans and the water barrel, my pupil had jumped into the large barrel we had there ready in case of fire. The young man ducked, and when his nose came up blowing water in the air like a whale, I grasped the situation:

The finest golden colony of Americans was after his skin. Taking a sack I covered the barrel and took the big smoker, which we called, on account of its size, the "Dadant" smoker, I easily chased the bees away; but I couldn't convince the prospective teacher to come out of the barrel until I started to smoke him out under the covering of the sack. He came out of the barrel as though from a dugout, asking:

"Are the Americans still around? My! what she-devils they are!"

Surely this lad was the first one in Europe to know what Americans are like when they get angry. The poor fellow had run like a Boche, perhaps quicker. And he seemed to enjoy the barrel; yet this made me glad to have only one pupil, because at that time barrels were pretty dear and scarce.

Since then the young man displayed great care about that special refuge. Americans are able to make you like even water barrels sometimes.

* * * * * *

I had arranged all there was to be done in order to move the bees from my place to the other location. We had spoken to a moving van proprietor who liked bees and wanted to help us. So he was to come one evening and haul them over. Unfortunately, I was called to town for an hour. That hour lengthened to half a day. So I telephoned to my pupil to start the whole thing alone. He seemed happy to be entrusted with this business and assured me he would do his best.

Coming home in the evening, I was just thinking about my bees, when I saw, some hundred yards from my home, people running, fighting the air with their fists, and others with their coats over their heads. Some of them were weeping, but nearly all were swearing like heathens.

Then I saw a cart which looked queer in the darkness. The horses before the cart were jumping up and down as though they were rocking. A man was hanging on their bridles and was carried away by them toward the darkest part of the street. There he permitted his horses to start a race across the town, while he threw himself on the ground, covering his head with everything he could reach. Near the cart was a man in my pupil's clothes, but he had a strangely contorted face, frightful to behold.

As this monster saw me he spoke in a well-known voice:

"Oh Lord! the Americans, sir; the Americans have broken loose!"

It was my pupil, but the Americans had made of his clever, bright face something like a Chinese idol's hideous figure.

The poor fellow continued:

"I didn't fasten strongly enough those divisible hives, and now the Americans are streaming out."

This was no time to scold, so I asked, quickly:

"Where is the Dadant smoker?"

"Beg pardon, sir," he went on, "I didn't think of it; I forgot to take it. This is why I am not able to handle the bees."

"Then hurry; bring some water in your felt hat. Hurry!"

"Excuse me, sir; but how will we sprinkle it over the bees? They will drown."

"You are going to sprinkle them with your mouth, like the washerwoman does before she starts ironing the linen."

My pupil's face brightened, as far as his swollen skin permitted, and he ran to the nearest water hose on the sidewalk.

* * * * * * *

I looked at the hives and saw the Americans streaming out. My flashlight seemed to anger them. At that time I used to perfume my clothes with violet in order to pacify the bees. Surely this saved me from having trouble that night, because the Americans were furiously patrolling the air.

From afar I heard my pupil's voice. Somebody wanted to take him away, while he was protesting loudly:

"I can't come, sir; I am busy now."

The other voice ordered, angrily:

"You will come to the police station, or I will use force. You have disregarded my order. The whole neighborhood is complaining against you. Come to the police station."

"But I am not in the police's service," went on my pupil's voice. "I am in that gentleman's service."

"Then I am going to arrest this man, too."

I had lowered my hat over my eyes on account of the warrior-like behavior of my bees. I turned my flashlight on the policeman and told him briefly:

"Don't advance! Stop! Stay where you are!"

The policeman advanced toward me, saying, with harshness:

"How dare you give me orders? I am going to arrest both of you for the trouble you are causing with these bees; you and this fellow here."

"Well, do as you like,' said I, "but don't advance. I warn you."

"Without hesitating, the policeman advanced, put his hand on my pupil's arm and said, authoritatively:

"You are under arrest. Come with me to the police station."

Thus saying, he grasped my pupil's arm and was going to pull him towards the police station. He had not even finished his sentence when he gave a yell and started to slap his own respectable face with both hands. Then, without even taking leave of us, he began the most wonderful race I ever witnessed. He ran in the direction he came from. My pupil stood there a few moments, laughing, then he became mournful and said:

"Beg pardon, sir, would you mind taking this hat in your hands? Because I will be gone."

"Where do you want to go just now?" I asked wonderingly.

"I don't **want** to go; I **must** go, sir," he went on, sadly.

"Go? Where? Where must you go?"

He simply put his hat in my hands and starting in the direction the policeman had gone, he said:

"I must go after the policeman, sir. I am under arrest; I must run after the policeman."

"Stay here," I laughed; "you have plenty of time to be arrested."

"No, sir," he went on, with a very serious air. "I am a stranger in this city, and if that man goes out of sight I won't be able to find his old police station, and will get lost. I must hurry, sir."

I couldn't remain without help there, so I used my whole strength to retain him, till I was sure that the policeman was out of sight. Finally he acceded to my wish; but said, sighing:

"I would have been proud to catch that man, to show him what a good racer I am; because it seems to me that he must be a professional racer."

With some trouble we removed the cart from that spot. People still came to look at our business and then ran away like Boches.

The pupil and prospective teacher, after seeing how many people came, only to be chased away by our bees, said:

"No, I don't believe that policeman was a professional. I see all those who come near us become first-class racers." Then rubbing his swollen face, he added:

"I wonder who wouldn't be a first-class racer, with these American she-devils behind?"

A Novel Queen Mating Nucleus

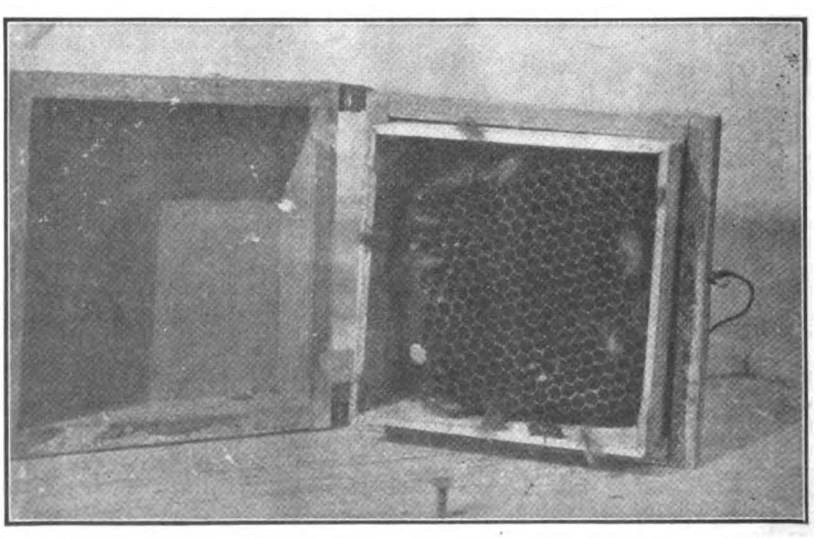
WHEN it comes to mating queens with a minimum of equipment as well as the smallest possible number of bees in a nucleus, C. B. Bankston, of Buffalo, Texas, probably holds the record. When the baby nucleus was brought out, it seemed that the limit had been reached, but Rauchfuss brought out his mating box containing three comb-honey sections. The great difficulty with these small mating nuclei lies in the difficulty of maintaining them and the frequency with which the bees swarm out when the queen goes on her mating flight.

Bankston has discounted the smallest nucleus previously offered by more than half and is now mating queens successfully with a small box enclosing a single comb-honey section. The photo will give a good idea of this little nucleus. It is composed of a small wood frame which comes together over the section like an old-fashioned daguerreotype photograph. Two sides are covered with pasteboard and the flight opening is made by pushing a lead pencil through the pasteboard. The small opening is just right for one bee to get through at a time.

In stocking these small nuclei he places a ripe queen-cell on the comb and shakes in about 50 bees, never more than 100. The thing is then closed and carried to some distance. With perhaps a hundred of these small nuclei he drives far enough from the apiary to prevent the bees returning to their hives. The nuclei are hung on wire fences, in trees or other convenient situations. No effort is made to maintain them permanently. As soon as the young queens are mated and laying they are used to fill orders and go immediately into the shipping cages.

Mr. Bankston maintains that there is less trouble from swarming out than with the baby nuclei or other small mating hives which are designed to be maintained during the season. He says that the number of bees is too small to establish a swarming impulse, and hence the loss is very small.

Since there is no effort to maintain these small colonies and only a few bees are used in each, a large number of queens can be mated without seriously reducing the breeding colonies or honey-producing colonies in the apiary. The great cost in bees of maintaining mating hives is the chief drawback to commercial queen-



C. B. Bankston's mating nucleus made from a single comb-honey section.

breeding and if this Bangston plan can be utilized successfully it will result in a great saving to queen breeders. It is such a radical departure from accepted methods that we hesitate to recommend it without trial. However, it is certainly worthy of a test and we will be glad to know how well other breeders succeed with the plan.

The Swarming Impulse

By C. C. Miller

I HAVE been much interested in reading in November American Bee Journal, page 379, the article on "Swarm Impulse" by that always interesting writer, Arthur C. Miller. He objects to the growing tendency to discard swarming-cells as inferior. Time was when it was quite generally believed that such cells were superior. Certainly one would expect a colony preparing to swarm—since swarming practically always occurs when conditions are of the very best—should do its best at making queen-cells. One proof that it does so is the fact that in the cells left by the young princesses there will always be found a remainder of dried royal jelly, showing that during the feeding period the royal larva had all the food it could consume and some to spare. On the other hand, when the beekeeper takes matters into his own hands, and induces the bees to rear queen-cells, no such residue will be found in the vacated cells. It does not necessarily follow that in the latter case the queen may not be just as good as one that has been fed a surplus, for what good can the surplus do if it is not consumed? But there is always the possibility that in some cases the youngster might have eaten a little more if it had had it.

So, although other cells may be as good as swarming-cells reared by the same colony, some of them may not be, making the swarming-cells in general the safer to choose.

Mr. Miller winds up by saying: "Save the 'swarming-cells,' if the stock is good. The queens will not inherit any swarming impulse." I'm not sure I know for certain just what is meant by that. If it means that there is no more danger of having the swarming tendency inherited through swarming-cells than through cells reared by the same colony, then I am in hearty accord. If it means what at first sight seems to be on the surface, that when swarming-cells are taken from a colony much given to swarming the resulting young queens will not inherit that tendency, then Arthur C. and I are no longer on speaking terms on that subject. Is it not a fact that some varieties or strains of bees are more given to swarming than others, and that that tendency is continued from one generation to another? How else can it be continued but by inheritance? In that case will not the young queen inherit the swarming tendency, whatever the kind of cells used?

I wonder if my good friend would not agree to stand with me on some such platform as this: Don't be afraid to use swarming-cells from any colony with which you are satisfied, but if you don't want swarming colonies you will do well to breed from those colonies which show least inclination to swarming, and are at the same time among the best in other respects.

Incidentally our friend has a theory that he is too "busy just now" to divulge, and according to that theory "when two cells of nearly the same age are left, one is destroyed soon after the first hatches, but not so when one cell is very young, or just started." I've always supposed it was just the other way around. How is it with others?

FIFTY YEARS AGO—FAILURE VERSUS SUCCESS

Charles Dadant, in the American Bee Journal for February, 1869.

A few days of good harvest being sufficient for populous colonies to fill their hives with honey, the whole secret lies in having strong stocks in readiness to secure the harvest which those few days offer.

Bees Self-Managed

During the winter and spring, the 40 beekeepers within 2 miles around my apiary let their hives remain on their stands without interfering with the bees.

The last year's honey, in large part consumed in the cold days of winter, was soon used up in rearing workers, together with a great number of drones.

The weather being very wet from April till the 10th of June, the bees killed their drones, then already full-grown, and the queens stopped laying almost entirely. The apple blossoms yielded no honey. The white clover began blossoming on the 20th of May and by the 10th of June more than half of the blossoms were already withered.

From the 10th of June the queens resumed their laying, but the flying of the bees on rainy days had reduced the population of the hives and the brood consumed the honey as fast as gathered.

On the 1st of July the hives were filled with brood and young bees; as the honey afterwards became scarce, they mostly starved or remained weak from want of sufficient nutriment.

From the 5th of July, the queens stopped laying. The lindens had blossomed 3 weeks earlier than usual. Some hives swarmed late, but the swarms and the parent stock remained weak till winter.

By the 10th of August the colonies were again too weak for gathering honey from summer flowers and from fall flowers, buckwheat, etc. The queens resumed laying, but, as in the spring, nearly all the honey gathered was consumed by the brood as rapidly as it was collected.

On September 16 brood and young bees were plenty, but the flowers were gone. The asters and other fall flowers were cut short.

Result

No swarms!
No surplus honey!
Bees starving for winter.
Poor season for bees!

Rational Beekeeping

As soon as my colonies were taken out of winter quarters, I gave them plenty of rye flour and opened the hives frequently in order to equalize all the colonies.

In April all my hives were filled with worker-brood. I raised very few drones, as I allow scarcely any drone-cells to remain in my hives.

In April the honey preserved in the hives by indoor wintering was consumed in brood-rearing. I gave to all my colonies, every two or three days in bad weather, several tablespoonfuls of syrup to maintain the laying queen. On the 10th of June the bees had no new honey in their hives. I had to feed syrup to all the newly-made swarms to keep them from starving.

From the 10th of June the remaining white clover gave plenty of honey; but for 10 days it was so thin that it seemed like slightly sweetened water. This continued till the 5th of July, my hives overflowing with bees.

On the first days of July all the cells unoccupied with brood were filled with honey. I extracted 2 or 3 frames (11x18 inches) from each hive. Very little honey in surplus boxes.

As soon as the linden blossoms were done I opened my hives frequently to remove combs for my swarms, as I had taken 3 swarms from each 2 colonies. I fed them till July 29.

On the 10th of August the bees were at work on the summer flowers and later on the buckwheat; and, filling their hives, stopped breeding. By the 1st of September some of my hives were so filled with honey that the queens had no room to lay. I extracted 2 or 3 full combs from each hive. In 3 days they were filled again.

On September 16 the frost killed the flowers, but my hives being too full of honey, I exchanged full combs for empty ones from my small swarms, equalizing them for winter.

Result

One and a half swarms and 60 pounds of surplus from each hive.
Good season for bees!

Moral

Honey is more abundant than good beekeepers.

About the Bee's Honey

By Dr. Brunnich

THE reader who, with his bread, is eating honey, scarcely imagines how much is required before the sweet ambrosia comes into his dish. That in the future he may have a double enjoyment in eating honey, I wish to tell something about the manner of its origin.

Every man knows, with the exception of some barbarians, like that peasant near Zoug, who bitterly accused my bees of devouring the blossoms of his cherry trees, I say, every man knows that the flowers secrete nectar, as a compensation to the insects for their services as love-messengers in carrying the pollen from one plant to another. By far the most important of those "postillons d'amour" are the bees, because they appear early in spring and in great numbers.

The heart of the bee beats in the abdomen and nearby the Creator has given to the little insect a most comfortable valise, the honey-sac. This is formed of a very thin elastic membrane, around which 2 layers of muscles are acting; by the contraction of the latter the honey-sac shrivels to a tiny knob, while the membrane is folded to thousands of little plies. When quite filled, the little bladder may contain about one decigram of water, that is about as much as the whole bee weighs. A wonderful valve leads into the stomach and at discretion the bee can shut the honey-sac or it can let run some microscopic drops into the stomach, if it needs new strength. When the bee is flying out for honey it takes drop after drop of the nectar, till the honey-sac feels full enough to go home.

The nectar of the flowers is very thin and often contains but about 20 per cent of cane sugar and 80 per cent of water. Why bring so much useless water into the hive? At least half of the water passes through the fine membrane of the honey-sac into the surrounding blood, while the bee is flying home. By this water the whole blood is diluted, but in the rectum there are 6 glands which withdraw the superfluous water, and before the bee enters its flight-hole it spatters out the water with a minute flash. And now it hurries into the streets of its waxen palace to seek an empty cell; but it has no time for long seeking. It does not care to sequester a cell in which the queen is about to deposit an egg. So the fresh honey is placed irregularly in the hive, in front and behind, above and below. The honey thus is spread over a great surface for evaporating. But by evaporating there is done only a small part of the thickening of the honey, from 30 to 40 per cent to about 18 per cent of water. The bees manage this themselves more efficaciously by carrying about the honey. Especially in the night, the young bees suck up the fresh honey, and after having withdrawn a new quantity of water within their honey-sac they pour the liquid in other cells. By so doing the honey is rendered thick in an effective manner and room is made for new coming honey. For the high season the question of room is a very important one in the beehive, for here come 20-to-40-days-old bees with nectar, or 15-to-20-days-old sisters, with both nectar and thick pollen pellets, all clamoring for empty cells for their burdens, while the poor queen hurries around searching for empty cells for the eggs which she must deposit or lose at random. Think of it! In the brood-chamber of a good hive there are 100,000 cells, more or less, 75,000 of which may be occupied with brood in all stages, and the queen demands 2,500 to 3,500 cells for her eggs daily; the bees need 15,000 to 30,000 cells for fresh honey and at least 2,000 for pollen. The most active change goes on daily, in the brood-nest; here the cells, which young bees have just left are filled with eggs again, or with pollen, or honey, and the ones must constantly make room for others. Often then, the room becomes short, and if the careful beeman does not procure space by giving new combs, or by extracting the filled ones, or by adding supers, there enters a condition of alarming lack of room, which hinders all the work and demands a shortening of the room allotted to both queen and workers. This either

Figure 2. Microphotograph of the rectal glands of the peritrophic membrane M. (Dr. Brunnich).

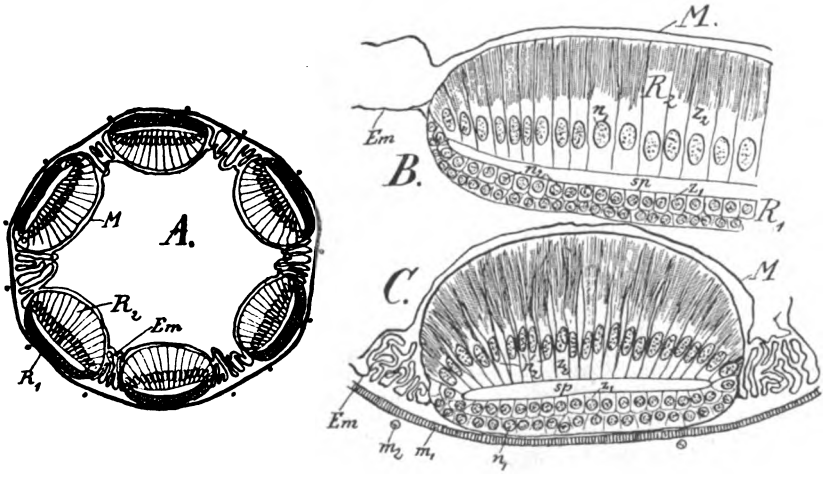


Figure 1. Drawing showing a magnified section of the rectum and of the 6 glands. Rectal glands of the honeybee. Dr. Bdunnich (original.)

a. Transversal section of the rectum.
b. Longitudinal section of one of the six glands.
c. Transversal section of one of the glands.
r-1. External layer of a gland.
r-2. Internal layer of a gland.
sp. Space between the two systems of the gland.
em. Epithelial membrane of the rectum.
z. Cells of the gland.
n. Nuclei of the gland cells
m-1, m-2. Annular and longitudinal muscles.
m. Peritrophic membrane.

The rectal glands consist of two series of cells, *r-1* and *r-2*, which probably have each secretory functions. Both enclose a slit-shaped long room, *sp.* I suppose that the glands execute a double filtration of the blood serum. The latter penetrates across the cells, *z-1*, into the mentioned space, and from there across the larger cells, *z-2*, into the free room of the rectum. The second system of the glands resembles much the wax-glands.

shortens the yield and weakens the population or leads to swarming.

With the carrying about of honey the busy creatures fulfill another important task. When the bee is licking up nectar or honey there always flows a little portion of a secretion of most useful albuminous ferments and probably formic acid. Both cause the inversion of the indigestible cane sugar into fruit sugar and grape sugar. Cane sugar cannot be assimilated at once by the stomach, while its components may immediately enter into the blood, where they produce the warmth of the blood and strengthen the muscles. Honey, as a food, not only spares to the stomach a considerable digestive work, but gives to the organism albumin and important aromatic substances, with stimulating and antiseptic qualities. Formic acid is a mighty antiseptic and has a most favorable fortifying influence upon the musculature of the heart.

When the honey is ripe, which happens in 4 to 8 days, the bees place it where they wish to have it definitely —around and above the brood-nest. There the thick liquid is corked up by shutting the cell with an artful cover of wax; the honey is capped. Now the honeycomb represents a more or less plane surface on both sides, so that the bees can easily walk there without smearing their feet. Jealously the little amazons watch these precious provisions, and they do not open the cells before they absolutely need food. So nobody is astonished when a populace which before was good-hearted at once becomes ill-humored and readily uses its weapons, if man has taken from them a part of their treasures. After the honey crop, the bees do not stand trifling. The experienced man knows how to treat them and willingly gives them, after the crop, part of the stolen goods, that his darlings may not suffer of hunger till the new honey season begins.

Reuchenette, Switzerland.

Mating Queens Over Colonies

Mr. Frank C. Pellett:

Dear Sir—In the American Bee Journal, 1917, page 344, we were favored with an article from you on "Increase With Little Cost." This method appealing to me, I tried it out in one of my outyards the past season, with no success.

Recently, on reviewing Gleanings for 1914, I find, on page 285, that Dr. Miller had tried to raise some queens over a colony with a laying queen, but failed. Editor Root's comment on Dr. Miller' "straw" stated that Mr. Doolittle had met with some success in getting queens mated in an upper story of a queen-right colony, but usually it proved a failure.

On page 796, Gleanings, 1914, Mr. Chadwick gave the result of his attempt at this stunt which was almost a complete failure on 75 colonies.

Just recently I received a copy of your "Practical Queen Rearing" and I find the identical plan which you proposed in the American Bee Journal in 1917.

In my own yard I tried it with about 50 colonies. Each colony had from one to three extracting supers on, and the brood was put above the supers with a wood-zinc excluder between the supers and the hive-body **below** containing the old queen.

In some cases, cells were started in the original brood-chamber before putting above. In other cases there were no cells when making the change, but in almost every instance cells were started and completed above. But here is where the "rub" comes—not a single queen got to laying above.

The entrance to the brood-chamber above was made in a half-inch rim between it and the immediate super below.

No doubt this method is a success with you, and I should feel much pleased if you could show me why I, as well as these other gentlemen have met with such dismal failure.

INDIANA.

Answer—As nearly as I can guess, the reason for failure in all cases reported to me is either having the upper entrance too near the one below, or the lack of a ripe queen cell. If a newly formed cell is given all the brood will emerge from the upper brood-nest before the young queen is ready to lay. I make a practice of starting a batch of cells in advance of the time when the brood is to be raised above the excluder. A ripe cell is always given the day following the raising of the brood and the young queen should emerge the second day after. If weather conditions are favorable the young queen should be mated and ready to lay before the brood has all emerged. With sealed brood present the young queen does not hesitate to begin laying in a normal manner. If no brood is present she is likely to make an effort to reach the brood-nest of the old queen below the excluder and be lost in the attempt.

The entrance to the upper brood-nest should be on the opposite side of the hive from the one in the lower body. Otherwise the young queen is likely to enter the lower story with the old queen on her return from her mating flight.—F. C. P.

The Sense Organs of the Bees

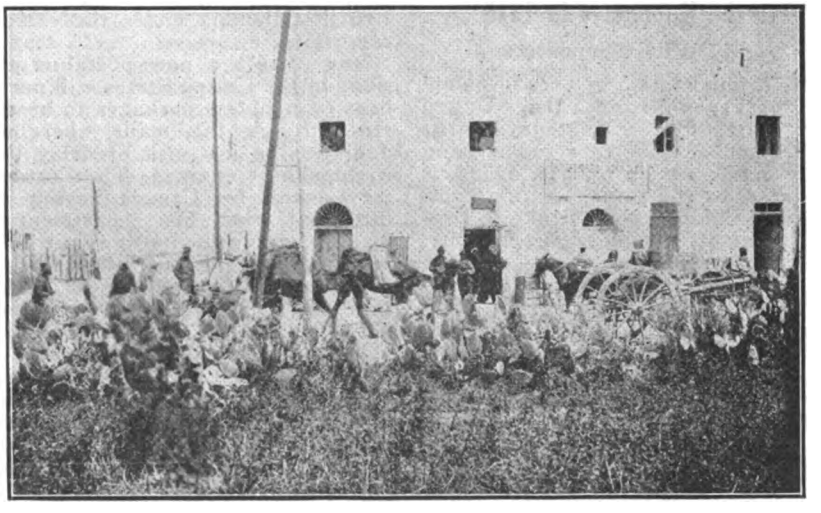
By Terrisse Trelex, in the Bulletin Suisse for October, 1918

HONEYBEES have exceedingly acute organs of smell; they also have an excellent memory, and in addition are very skillful in taking note of guiding marks.

It is through memory and the observation of guiding marks that they succeed so well in finding their way back to the hive. They depend upon this almost exclusively. It is through the ambiance or environment of their home, more than by its particular color that they recognize it, and the proof lies in the ease with which we deceive them by placing another similar hive in the location of their own, when making artificial swarms. One might almost say that, apart from the attractiveness of appearance, it is of little use to paint hives of different colors, in an apiary.

It has been said with reason that it is less the difference in the tints than the difference in brilliancy which impresses itself upon the eyesight of our insects.

Bees see, but in a different manner from ourselves. In a general way, we must take notice that man reasons and rectifies his impressions through his reasoning, while the animal does not reason, or at least very little. A horse, for instance, does not see correctly, because reasoning is lacking in him. He will shy at a shadow across the dusty road, at a piece of white paper, at a lump of dirt, all things that he should consider as very common. But in the eyesight of the bee there is an essential difference with the behavior of our own eye. She does not leave her occupations when we suddenly uncover the combs; the passing suddenly from darkness to blinding daylight does not annoy her; but she



The house in the picture is so white that the photograph does not even delineate the crest of the roof from the sky. But the stove-pipe, in the upper right-hand corner, shows plainly where that line is. The roof is flat, terrace-shaped. The location is Djebel-Djelloud, a suburb of Tunis, and belongs to Mr. Andre Terrisse, brother of the writer of the article.

may be irritated by the sudden current of air or by the cold which exposes her brood to danger.

Here is a fact which proves that bees are not directed by the tint so much as by the **glare** of colored objects; for the glare may be similar when, to our eye, the colors are dissimilar.

I had an apiary in Tunis, where, from May till November, under a blazing sun, the sky remains relentlessly blue, and where the houses are exceedingly white, being every year bleached with lime.

Several of my hives were separated from the watering spot by a long building, a shed whitewashed with lime. Two years successively I noticed, especially at the time of active brood-rearing, March and April, that the workers, in their numerous trips to the water, often failed to go around or fly over the shed; at the exit of their hives they would fly towards the water, at ordinary height, and would strike violently against the white wall; many not being able to rise again, but dying on the spot. Others perished in a similar way upon their return home from the water.

Evidently they were deceived by the similar **glare,** and made no distinction between the white wall and the blue sky, a distinction which is easy to the human eye.

The number of bees which died in this way was so great that I finally removed the apiary from this spot, although in other respects the spot was satisfactory.

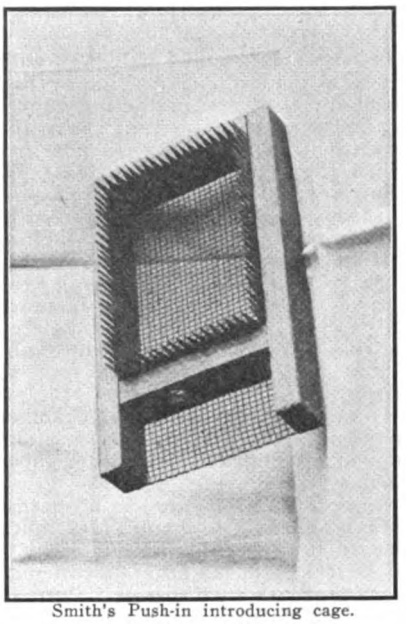
(This is very interesting. Many people have noticed what this writer mentions—as to the indifference of the bees to the uncovering of their brood-combs, if it is done without jar. They will even fly to the field, from this opening, as if it were the usual way of exit. But let a quick motion be made over this opening by the apiarist, and perhaps dozens of bees will fly at him to punish him for his daring.—Editor.)

Shipment of Pound Package Bees to the Kootenays in 1918

B W. J. Sheppard

THE importation of bees in pound packages from the United States to the Kootenays, British Columbia, came to a sudden stop early in the season of 1918, owing, it is stated, to the transportation companies declining to undertake to convey them by the most direct route, probably owing to the conditions prevailing on account of the war.

The first large shipment from California, consisting of 58 two-pound packages, arrived in Nelson on April 21. Instead of coming in via Portland and Spokane on the Great Northern, the quickest route, only taking from three to four days, the way the consignor stated he routed them, they came round by Vancouver, thus causing a delay of several days. Owing to this they were in very bad shape on arrival in Nelson, 17 of the packages being all dead, 24 about half dead, and the remaining



Smith's Push-in introducing cage.

17 only in fair condition. As they had another 80 miles to travel after reaching Nelson, and had unfortunately missed the connection, they had to remain over at the depot for a further period of two days. The 41 lots that contained living bees were fed two or three times with syrup before being re-shipped, which kept them alive until they reached their final destination. After being put into hives they were each given 2 five-pound cans of syrup and then had to be left to take care of themselves. In spite of this and the bad condition they were in on arrival many of those 41 lots have built up into fairly respectable colonies, although they had only two frames of comb to start with and had to draw out foundation. The dandelions, which were very numerous in the locality, helped them considerably, and they are also situated in a good clover district.

On being informed as to the delay and the state in which this shipment arrived, the consignor sent word that he would not ship any more bees to British Columbia under the existing conditions.

Now that the new postal regulations in the United States will permit bees in combless packages to be carried through the mails, there will doubtless be less risk of delay than if shipped by express. The Postmaster General for Canada having just intimated that his department is making arrangements to admit living bees to the Canadian Inland Parcels Post and will shortly issue instructions on the subject, the beekeepers here are looking forward to being able to obtain the package bees by this means in 1919.

In 1916 and 1917 many of the two-pound packages shipped into the Kootenays from the United States gave a surplus of 100 pounds and over per colony the first season.

The writer having had many opportunities of examining these bees on arriving at their destination, in the past, believes that if they were sent out supplied with a larger quantity of food they would stand a much better chance of coming through in good shape and a few days delay would not then so much signify.

Nelson, B. C.

A Safe Introducing Cage

THE question of safe introduction of valuable queens is always before us. Most of the methods which are known to be dependable under all conditions require more or less of trouble and time to put them into effect. Probably no one is so constantly reminded of the necessity of improvement in methods of introduction as the queen breeder. The success of his business largely depends upon the success with which his customers are able to introduce the queens which he sells. The many foreign odors acquired by a queen-cage in its journey through the mails adds to the normal difficulty of introducing a strange queen into a new colony.

It is a well-known fact that where the queen is introduced by means of a "push-in" cage which covers a small amount of brood-comb in which she may begin laying, before being released, she is seldom lost. With this idea in mind, Jay Smith, a well-known Indiana queen breeder, has devised a cage which is used in connection with the ordinary mailing cage. One of the illustrating pictures shows the details of his push-in cage, while the other shows how it is used by removing the cover to the opening in one end of the mailing cage. This permits the queen and the bees which accompany her to enter the other cage which is pushed into the comb. She has thus a small amount or brood-comb available ,but the hive bees cannot reach her until she has acquired the hive odor and has begun laying. After a few days the cage can be carefully removed and the frame replaced in the hive with very little danger to the queen. The difficulty with most of the push-in cages is in getting the queen into them. Mr. Smith has solved this problem very nicely, as will readily be seen.

My Experience With European Foulbrood

By Frank Coverdale

NINETEEN-SEVENTEEN was a very poor honey season, making it a very hard task to fight disease. Many colonies were so weakened that by June 1, 1918, nearly half of 300 colonies were finished. It looked to me that I was just going out of business, and more than once I thought to quit and be done. Then I would think how the Cogshalls had made good in spite of what they called black brood, and the great stress they put on salting their bees. In the spring of 1918 all that was left had no bad brood until the last of May, and all built up well. In June the disease broke out here and there all over the yard. The first thing I did was to get a half barrel, filled with water. I stirred enough

salt to make the water taste just about as salty as one would like gravy. I placed some floats on this water and a comb of honey laid on the floats and in a short time thousands of bees were carrying the salted water. This was kept up by them all season. One of my neighbors came in the yard with an extra queen that he had just had sent in from the south. I said "give her to me; I will put her into this colony as an experiment." This colony had a bad case but was not weak yet. It proved to be the end of the disease in that colony, and it built up rapidly and began to store above. This induced me to send south for 25 more, and all were used where disease was found, or where black or hybrid stock was present. In all cases but one the cure was perfected. These queens were introduced as directed on cages. In other cases cells from what appeared to be immune Italian stock were given with equal results. I believe that the salted water was of itself a great benefit, as very much less brood appeared to be dead, and more time was afforded to get in stock that was immune. One thing I found for sure was, that it is not good policy to tolerate any weak colonies of any stock, as such will be affected. I believe it possible that where bees have been allowed to become inbred for years that a low state of vitality exists, and that such colonies are good ground for European foulbrood. That is just the way it looked in my yard; and that black bees must not be tolerated at all, if one wishes to stay in the business of raising honey. I know that it skipped all around good Italian stocks and thrived upon black and hybrids.

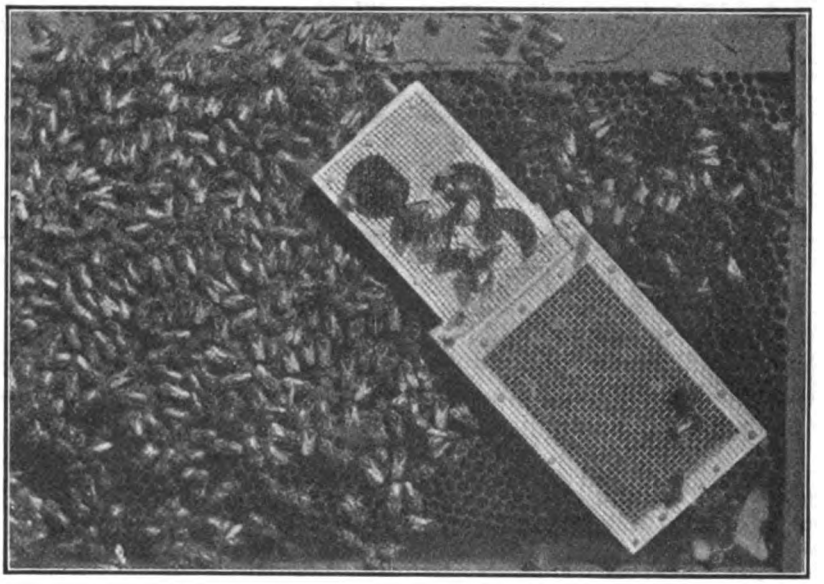
To find the affected colonies would be quite a big job if every hive is to be opened. Just walk down each row and notice very carefully the colonies losing energy, with less working force. That is the way I did it. It was a rare case that I missed my patient when a batch of queens would come as a lot of ripe cells were ready.

I am very happy to be able to say that I have in my yard 250 of the best stocks of bees that I have ever owned, and I never had a stronger lot of bees, and that when spring comes I will supply plenty of salt and proceed as above. When I look the situation over I am reminded of what Alexander said, "A blessing in disguise."

Delmar, Iowa.

Shall We Prohibit Spraying While Trees Are in Bloom?

SEVERAL letters have come to my desk of late which have to do with the poisoning of bees from the spraying of fruit trees while in bloom. In New Mexico it seems that a bill is pending in the legislature which provides a penalty for the application of spray poisons to the fruit trees before 90 per cent of the blossoms have fallen. A few States have passed similar laws and several others, after considering such measures, have refused to enact them.



Jay Smith's introducing cage as used in connection with a shipping cage.

At one time I used my influence for the passage of such a bill, in Iowa, although I must confess that I was not enthusiastically in favor of it. Since that time I have investigated the matter somewhat and now doubt whether such laws are desirable. Here in America we have come to look upon "laws" as the cure for every ill. Every day we hear somebody say that there should be a law passed prohibiting this or that. Perhaps we will learn in time that the mere passage of a law does not always remedy our troubles.

In the case of spraying, so many beekeepers report the loss of bees from the spraying of fruit trees while in bloom, that there must be some cause for complaint. However, it seems to me, after looking into the thing, that a law is not the proper remedy. In the first place, the passage of such a law is resented by the fruit growers as being aimed especially at them. Instead of developing harmonious action, it has the opposite effect. The interests of the fruit grower and of the beekeeper are mutual. It is recognized that bees are necessary to insure proper pollination of fruit blossoms. It is also taught by most entomologists and horticulturists that the best time to spray is after the petals have fallen. Not only may the bees be poisoned, but the fertilization of the blossoms may be retarded or to some extent prevented by spraying before that time.

This being the case, what we need is not a law punishing the man who reduces his own crop and kills his neighbor's bees, by improper spraying, but an educational campaign to give proper instruction in the application of the poison.

The fruit growers are as anxious to teach the mass of small orchardists to use spraying materials, as the beekeepers are to induce every beeman to treat foulbrood. The enactment of a law prohibiting spraying at any time may easily discourage its being done at all. In this case the fruit business has been injured.

There are few fruit growers progressive enough to spray their fruit trees, who will be purposely disposed to injure the bees on which they depend as an agency in the fertilization of their fruit. Instead of trying to force through a law against spraying while the trees are in bloom, the beemen and fruit growers should meet and agree upon a campaign of education in districts where spraying is improperly done. Such a campaign will result in great benefit to both the fruit grower and the beekeeper and should leave both with the best of feelings toward the other.

When, as sometimes happens, the legislative committees ask for definite proof of the injury to bees from this cause, the beekeepers find it difficult to prove their case. Our senior editor once served as a member of an Illinois delegation to appear in behalf of such a measure. The chairman of the legislative committee was an extensive orchardist who seemed disposed to be very fair in the matter. He asked for proof of injury to the beekeeper, and when an attempt was made to furnish specific cases which could be laid to this cause, the beekeepers were unable to find them. We are a little in the dark as to just how much the bees are injured from this cause, and here is a place where our experiment stations can render some real service to both fruit growers and beekeepers by making extensive and careful tests as to the extent of injury, time when bees are poisoned, and also in searching for a remedy. Judge Taylor, of Yakima, Wash., suggests that since the arsenate of lead is said to be sweet, the bees may be attracted to it at times when the trees are not in bloom. He also suggests the possibility of adding to the spray some repellent which is obnoxious to the bees and thus prevent them from taking it at any time.

From Washington comes the report that the greatest loss is not at the time when the trees are in full bloom,

but during the subsequent spraying for the second and third broods of codling moth. The injury seems to be worse in dry sections, where water is not easily available, which indicates that the bees, in search of water for brood-rearing, at times, suck up the newly applied poison.

Until we have more definite information on which to base our demands for legal protection let us appeal for help to the extension departments of our agricultural colleges in spreading information, and from the experiment stations in ascertaining the true conditions.—F. C. P.

MISCELLANEOUS NEWS ITEMS

Illinois River Valley Beekeepers to Meet

The annual meeting of the Illinois River Valley Beekeepers' Association will be held in Pekin, Illinois, February 7.

Necrology

We regret to announce the death of Mr. O. A. Comire, Secretary of the French Association of Beekeepers of the Province of Quebec, Mr. Comire was a young man, very active, and working strenuously for the advancement of the Association. He leaves a young wife and 4 small children. He died of heart trouble.

The National

The forty-ninth annual convention of the National Beekeepers' Association will be held at the Hotel La Salle, in Chicago, February 18, 19 and 20, 1919. The Chicago-Northwestern Beekeepers' Association will hold a business session at the same place during the day February 18, and then join with the National meeting.

Following is the program as arranged to date, but may have more numbers added:

Tuesday, Feb. 18—7:30 p. m.
President's address, minutes of last meeting and report of the secretary-Treasurer. Appointment of committees.
"Past, Present and Future of Beekeeping" ----------E. R. Root
Wednesday, Feb. 19—9 a. m.
"Beekeeping and the New Era" Prof. Francis Jager
"A New Organization of Beekeepers" ---------- Colin P. Campbell
Questions
1:30 p. m.
E. D. Townsend—Topic not decided.
"Factors Influencing the Secretion of Nectar" ------ Dr. E. F. Phillips
Questions
7:30 p. m.
"Beekeeping as seen by a Bee Inspector ------ Prof. F. Eric Millen
"Organization" ------Chas. B. Justice
Questions
Thursday, Feb. 20, 9 a. m.
"Beekeeping in Dixie" Kenneth Hawkins
"Organizing Local Societies Prof. H. F. Wilson
Questions
1:30 p. m.
"International Beekeeping" C. P. Dadant
Prof. E. G. Baldwin—Subject to be selected.
Election of officers and reports of committees.

Extension Work in Texas

The Extension Department of the Texas Agricultural College is lending assistance to the beekeepers of that State and co-operating with the various organizations. Mr. H. B. Parks, formerly of the University of Missouri, is in the field as special beekeeping worker. Mr. Parks frequently assists in the development of county organizations, which in turn co-operate with the office of the State Entomologist in the inspection work. There is much call for work of this kind and Mr. Parks finds his time well occupied.

Program of Short Course for Beekeeping in the New York State College of Agriculture, Ithaca, N. Y., February 24-March 1, 1919.

Monday

10 to 12 a. m—Meet for organization in Room 392, Roberts' Hall.

1 p. m.—Introductory talk by J. G. Needham. The Outlook, by Geo. H. Rea.

1:30 p. m.—Fundamentals of Bee Behavior Outside the Active Season, by Dr. E. F. Phillips.

3 p. m.—Fundamentals of Beekeeping Practice Outside the Active Season, by Geo. S. Demuth.

Tuesday

9 a. m.—Fundamentals of Bee Behavior Outside the Active Season (for outside wintering), by Dr. E. F. Phillips.

10:30 a. m.—Fundamentals of Beekeeping Outside the Active Season (for outdoor wintering), by G. S. Demuth.

1 p. m.—Outdoor Wintering, by A. Gerdon Dye. Queen Rearing, by Geo. H. Rea. Breeding Bees, by Geo. B Howe.

Wednesday

9 a. m.—Fundamentals of Bee Behavior Outside the Active Season (for cellar wintering), by Dr. E. F. Phillips.

10:30 a. m.—Fundamentals of Beekeeping Practice Outside the Active Season (for cellar wintering), by Geo. S. Demuth.

1 p. m.—Introductory Remarks, by G. W. Herrick.

1:15—p. m.—Wintering as Practiced in New York, by Geo. H. Rea.

2:30 p. m.—O. L. Hershiser.

3:30 p. m.—Wintering, by S. D. House.

7:30 p. m.—Evolution of Beekeeping Practice in the United States (illustrated), by Geo. S. Demuth.

Thursday

9 a. m.—Fundamentals of Bee Behavior During the Active Season, by Dr. E. F. Phillips.

10:30 a. m.—Fundamentals of Beekeeping Practice During the Active Season, by G. S. Demuth.

1 p. m.—Comb vs. Extracted Honey in New York State, by Geo. H. Rea.

2 p. m.—The Dadant System, by C. P. Dadant.

3 p. m.—The Past of Beekeeping, by E. R. Root.

Friday

9 a. m.—Fundamentals of Bee Behavior During the Active Season, by Dr. E. F. Phillips.

10:30 a. m.—Fundamentals of Beekeeping Practice During the Active Season, by G. S. Demuth.

1 p. m.—Factors Influencing Nectar Secretion, by Dr. E. F. Phillips.

2:30 p. m.—Locality, by G. S. Demuth.

4 p. m—Obtaining the Maximum crop in New York, by Geo. H. Rea.

7:30 p. m.—Beekeeping in the United States (ilustrated), by Dr. E. F. Phillips.

Saturday

8 a. m. to 12 m.—Diagnosis and Treatment of Bee Diseases, by Dr. E. F. Phillips.

10:30 a. m.—Bee Diseases in New York State, by Geo. H. Rea.

11 a. m.—The Future of Beekeeping, by E. R. Root.

Chicago Northwestern Association

The Chicago Northwestern Association will hold their annual meeting at the La Salle Hotel, Chicago, February 18, 1919. The following speakers expect to be present:

Dr. E. F. Phillips—"The Control of European Foulbrood."

C. P. Dadant—"Honey Manufacture."

Edward Hassinger, Jr.—"Building an Effective Windbreak with Cornstalks and Woven Wire Fence."

Miss Iona Fowls, Assistant Editor of Gleanings, in Bee Culture, expects to be present, but has not announced her subject yet. We expect some other speakers, but have not heard from them definitely. We will have just two sessions during the day, as the National will start their meeting the evening of the 18th. By holding a joint meeting any beekeeper can well afford to attend both.

JOHN C. BULL, Sec.-Treas.

Ontario County Beekeepers to Meet

The Secretary, Mr. F. Greiner, writes to announce that the next meeting of Ontario County, New York Beekeepers' Society will be held at the court house in Canandaigua, on February 11, 1919.

Bees at Kansas Agricultural College

Dr. Merrill has arranged for a series of beekeeping lectures at the Kansas College during Farm and Home Week, to be held at Manhattan, February 3 to 8. Doctors Merrill and Tanquary, of the college, will speak and several of the Kansas beekeepers will assist them with the program. We note that C. D. Mize, J. A.

Nininger, Roy Bunger, Harry A. Huff, L. V. Rhine and C. A. Baxter are among the number.

Obituary

We are sorry to announce the death on the 29th of December, at Oakland, Calif., of W. A. Pryal, the well-known beekeeper and writer. Mr. Pryal was a constant contributor to the American Bee Journal, the last article from his pen having been published in the December number, page 405.

Mr. Pryal, we are told, was sick about six weeks, but his demise was altogether unexpected, as he was only 62 years old and still in his prime.

DR. MILLER'S ANSWERS

Send Questions either to the office of the American Bee Journal or direct to DR. C. C. MILLER, MARENGO, ILL.
He does NOT answer bee-keeping questions by mail.

Miscellaneous Questions

1. How many trips will it take for a bee to fill a cell with honey, on an average?
2. Is it best to requeen in spring, or fall?
3. When I try to unite weak colonies they kill out one or the other. How shall I prevent it?
5. Is it best to have a cloth between cover and top of frames here in the warm climate of southwest Texas?
6. Will it pay to use queen excluders on all hives, and which is best, zinc, wire or wood?
7. I have 21 colonies and have bought four Italian queens. Now, can I Italianize my small apiary next spring from queen cells from these 4 hives, or even one of the best ones? TEXAS.

ANSWERS.—1. I don't know. It has been estimated that in order to carry in a pound of nectar, 20,000 trips would have to be made.

2. Perhaps in fall, as a rule, or rather about the close of the honey-flow. Yet, if one were requeening for the sake of getting in new stock, it would hardly be advisable to wait till the fall of next year, but rather to act in the spring.

3. One way is to take empty hives and put into it the frames with adhering bees from each hive alternately. Perhaps a better way is to put over the top-bars of one of the hives a sheet of newspaper and set over this the other hive, allowing the bees to gnaw a hole through the paper and unite at their leisure.

4. Strictly speaking, a division board is one which closes one part of the hive from another, not allowing bees to pass. It is of use to separate the hive into two parts when you want to have two or more nuclei in one hive, or when you want to confine a colony to a smaller space. If the board is small enough to allow the bees to pass on all sides, it is called a dummy. It may be used at any time to fill up vacant space, but is perhaps chiefly useful at one side of the hive to make it easier to take out the first comb.

5. It depends upon the space above top-bars If it is more than about a quarter of an inch, then it is better to have cloth, so as to prevent combs being built in the space. I should prefer to have only beespace above the frames, so as to do without the cloth.

6. For section honey I never used excluders, but most beekeepers use them for extracting. Wire excluders are probably best.

7. Yes, indeed; if you had 100 colonies you could requeen all from one queen.

Wintering Bees in a Small Building

I have five colonies which I am thinking of wintering in a small building. Do you think the colonies could be safely stacked on one another?

If the door was left open on warm days, would the bees be apt to mark their new location and make their flights in safety, or would it be the best plan to have them shut up until early spring?

What would be the best time in spring to remove them? ILLINOIS.

ANSWER.—The stacking on one another is all right, but wintering in a building above ground is not much in favor if there is no direct opening to allow the bees to fly whenever the weather favors. Still, with only five colonies, it may be that they can be near the door, facing outward, so that when the door is opened they will be about the same as out of the building. But if they are where they will be partly in the dark, even when the door is opened, then it may be better to leave them until a warm day in March or April. But if it keeps down to about freezing in such a room, then they might better be outdoors.

Confining Foulbrood Bees

1. I have a few colonies of bees with American foulbrood to be treated when the proper time arrives. I propose to shake bees on frames with full sheets of foundation and confine them two or three days, thus compelling them to consume every bit of foulbrood honey which may be in their honey sacs.

Do you think my plan is a good one? If not, what objections would you have? ONTARIO.

ANSWER.—If I understand correctly, your departure from the usual plan of shaking or brushing is that instead of leaving the bees to fly you will confine them in the hive, your idea being that they will use up all the bad honey in their sacs before they fly. I don't know for sure, but I don't believe you'll like the plan. As long as they will use up the honey in their sacs anyhow, what will you gain by an irritating imprisonment? Not being in a very happy frame of mind, it would not be surprising if they should swarm out when freed.

Wintering—Colony Without Queen for Winter

1. On page 350, October American Bee Journal, column 2, answer 2, you say later on you will crowd them to one story. Why not (if they were to be united on their summer stands) leave them in two stories?

2. I believe you use honey in hot drinks, do you think the heat kills those little germs that you tell us live in honey; I believe you call them vitamins?

3. We are told to put something over the top-bars of the frames in covering our bees for winter, so that the bees climb over from one comb to another. How do they get over in a tree or other places where no man interferes?

4. I found a dead queen on the alighting-board November 10. Would you try to give that colony a new one as late in the season as this, or will the bees live until spring and accept of a new one then, and will those old bees care for brood at this time? NEBRASKA.

ANSWERS.—1. But they are not to be left on their summer stands, for they are to be—rather have been—carried into the cellar. If they were to be left on their summer stands it might do to have them left in two stories; but the point I was making is that one story is enough to hold them.

2. I don't know, but it is possible the vitamins are destroyed by heat. Still there is left the advantage that no inversion of sugar in the honey is needed, it being already inverted, and also the advantage of the minerals in honey that are entirely wanting in ordinary sugar.

3. I'm not greatly interested in what bees do in trees, for my bees are not in trees. Indeed, I am not interested in putting anything over top-bars to allow the bees to pass over, for my bees have ample opportunity to pass from one comb to another, since the hives are taken into cellar just as they were on their summer stands, there being always a bee-space between top-bars and hive-covers. If bees in trees cannot easily pass from one comb to another, so much the worse for the bees in trees. It isn't always best to follow nature too closely; our chickens are better off in a good hen-house than roosting in trees in zero weather. I think, however, that when bees build combs in trees you will generally find that they leave plenty of chances for getting from one comb to another, not always at top, but a little farther down, which is perhaps better.

4. I think I would let them alone till spring. It is not certain they are queenless, but entirely possible that the dead queen has been superseded by one of her daughters.

Nuclei for Queen Rearing

I wish to rear my own queens. I propose to rear them in 2-frame nuclei, that is to say, from each colony I will take two frames of bees and brood, giving to same a ripe cell from approved stock.

What I want to know is, can I keep such small colonies on two frames from, say second week of July to about first week of September, without them swarming out?

Describe the simplest way to return the two combs of bees an brood to the hive from whence they were taken.

You see, my objct is to requeen, but I want to do it after the harvest is over, so I will have more time and also not interfere with the honey crop.

What worries me is the bees of the small nuclei returning to their old locations, and the possibility of starting an offensive, when returning the two combs of bees, brood and queens to old parent stock. ONTARIO.

ANSWER.—If from a normal colony you take two frames of brood with adhering bees, and put them in a hive on a new stand, you will find in a few days some of the brood neglected because there are too few bees to cover it, if, indeed, the whole of the bees have not stampeded. If you imprison the bees for about three days, there may be no trouble. Queenless bees will stay where they are put better than queenright ones. The larger the number of bees in a nucleus the better they will stay in a new place. If you are going to make a number of nuclei at one time, a good way is to put on one stand all the frames you are going to use, together with their adhering bees, if necessary piling them two stories or more high. With each pair of combs better brush into the hive the bees from another comb. No need to imprison the bees. In 3 or 4 days distribute the combs to their respective places, and if you have been liberal in the amount of bees there will be no serious trouble from returning bees.

If you try to keep each nucleus restricted to two frames, there is likely to be swarming galore. But if you give them room enough there will be no trouble.

The simplest way to return the nuclei later in the season to the hives from which they were taken is to return them. There should be no danger of fighting. But will you want thus to return them? At the time you took two frames from each colony, of course you replaced them with other frames, and it will not be advisable to disturb them later. Better unite the nuclei to make one or more strong colonies.

(The queens may be introduced in the usual way.—Editor.)

Good Locations—Package Bees

1. Where do you think would be the best

place to locate to start a bee and poultry farm?

2. Do you know anything about the eastern country—Maine, New Hampshire, Vermont, New Jersey, New York—such as advertised so cheaply by the Strout Land Company?

3. How does one manage bees that are bought in pound packages? Do you have to have full-drawn combs for them to start working on, or would they start on full-sheets of brood foundation? IOWA.

ANSWERS.—1. I don't know. Some places are very much better than others for bees because of unusual pasturage, but when you find an unusual locality for bees you will find an unusual number of bees already located there. In the majority of cases it is probably true that a man will do as well at beekeeping right where he is as to hunt up some new locality.

(There is excellent bee country within a hundred miles of Fairbank, Ia., possibly within sight of it.—F. C. P.)

2. I am not informed. (There are in most cases serious drawbacks which account for the low price of the land.—F. C. P.)

3. In the great majority of cases a queen is bought with a package of bees, and the bees may be treated just as a swarm of bees would be treated. They may be put in a hive with neither comb nor foundation, although in that case there is danger of their swarming out; they may have drawn combs given, which is probably the best thing, or they may be put upon full sheets of foundation, and this last is probably the usual treatment. When convenient it is quite common to give them a frame of brood.

Queen Rearing

1. What instruction can you give me about raising queens?

2. How may I be certain of mating an Italian queen with an Italian drone?

3. Have you the Italian queens for sale? ALABAMA.

ANSWERS.—1. It would take a whole book to give you very full instruction about rearing queens, and there is hardly room for that here. But Frank C. Pellett has written such a book, which is fully up-to-date, "Practical Queen-Rearing."

2. That is a difficult thing. Here's one way you might try: Take into the cellar the hive containing the virgin and the drones, and take it out after too late in the day for virgins and drones to fly, say 4 o'clock. Give them feed to help excite to flight. You may succeed and you may not.

3. Either the publishers of this journal or its advertisers can furnish you with Italian queens.

Foundation Fastener—Glass in Supers

1. Would you recommend the Daisy Foundation Fastener in beekeeping? Could it be used in fastening foundation to brood-frames, or is it merely wired in the frames.

2. Is it a good idea to have glass in one end of comb-honey supers to see when they are filled and save the trouble of opening at the top of the hive? I have not seen any supers advertised having any glass in them, and as I am only a beginner in bee-keeping, would appreciate your advice on these subjects very much. ILLINOIS.

ANSWERS.—1. It is a good tool for a beginner to use in fastening foundation in sections, but not at all adapted for brood-frames.

2. Fifty years or more ago glass was used, but nowadays it is as easy with present arrangements to see without the glass, and you can get a more satisfactory understanding of conditions without the glass than with it.

Shaking—Uniting Caged Queen

1. Will you give me the best way to shake bees, to prevent swarming, and build up the colonies good and strong.

2. How can we unite the weak colonies when we have two queens and two hives of full stores and brood-combs? They will need the honey from both hives. How can we put it all in one hive?

3. How long can a new queen be kept, after receiving, before placing in the hive? SOUTH DAKOTA.

ANSWERS.—1. I'm not sure what you mean by "the best way to shake bees," but think you may mean to shake a swarm, which some people are illiterate enough to call "shook-swarming." This shake-swarming is merely anticipating natural swarming by operating a little before the bees would swarm naturally. Take away from the colony all but one of its brood-combs with adhering bees (being sure not to take the queen), and put these in a new hive on a new stand, filling vacancies in each hive with full frames of foundation. Give the queenless bees a virgin or ripe queen-cell, or, better still, a young laying queen. In a fair season you ought to have two strong colonies for winter.

2. One of the best ways is to use the newspaper plan. Simply put over the brood-combs of one hive a sheet of newspaper, then set over this the other hive. The bees will gnaw a hole through the paper and gradually unite without any quarreling. Generally it is best to put the weaker over the stronger one. If there is any choice of queens, kill the poorer one; otherwise let the bees settle which shall be left. In 3 or 4 days, or any time later, at your convenience, put into the lower story any brood from above and the best frames of honey. If the honey from the other frame is needed, extract and feed back.

3. If kept in a warm place she ought easily to stand being imprisoned two weeks after the time she was caged, and probably she would generally stand twice as long. The shorter the better.

Cellar Wintering

1. In wintering bees in a hot air furnace cellar the room in one corner is too cold the latter part of winter. The weather now is 32 degrees outside and 52 inside cellar. There is a chimney 8x12 inches inside by 40 feet high standing 10 feet from partition, and furnace about 4 feet from partition on other side. Would it benefit the bees to pipe the warm air from above the furnace into the bee cellar and connect another pipe from chimney into bee cellar? How would the pipes best be arranged—draw the cold air out of the bottom or top of cellar? There is quite a draft to the chimney. What size pipes would be necessary? Would such an arrangement cause continuous circulation of fresh warm air?

2. What do you think of the idea of furnishing water in some way to the bees for winter use? Has it ever been tried? WISCONSIN.

ANSWERS.—1. Without fuller particulars it is not easy to advise. If there is a door between the furnace room and the bee room, the easy thing would be to let the door be sufficiently open. Of course, both rooms would have to be dark. If there is no door, then you might make a 6-inch hole through the partition at the bottom, near the furnace, and another at the top. If the furnace room is dark, no pipe would be needed. If the furnace room is light, a 6-inch pipe could pass through the partition, having an elbow or two to shut off the light. It will increase the circulation to follow your suggestion and let a pipe run from the lower hole to the chimney.

2. In a dry cellar it might do good. I have tried it; but not with much success.

(I do not believe in it. Bees do not need water except to rear brood.—C. P. D.)

Carniolans—Jumbo Hives

1. I would like to hear from Dr. Miller if he knows any good queen breeder that I could depend on as to pure stock and free from disease.

2. Can I put two queens into one hive only could it be arranged, by dummy board or queen excluder; or won't it work at all?

3. Don't you think that Italian queens could be raised in Carniolan hives by Carniolan bees, as they are better for cell builders? Last summer my Italian bees could hardly raise any queens, but Carniolans had very nice cells.

4. Would you advise to change from standard 10-frame Langstroth to Jumbo? I think they will give more trouble in manipulation, as I have 100 colonies in standard hives and run for extracted honey. WISCONSIN.

ANSWERS.—1. It is not the thing to mention any particular breeder in this department, but I think you will find that those who occupy the advertising department are reliable, and I refer you to that department.

2. If your idea is to give an extra queen so the two queens will lay more eggs to have more brood reared, you'll find it will not work. For no matter how many nurses you might have, no more brood can be reared than the bees can cover, and one queen can lay all the eggs a strong colony can care for. But some have reported success by putting a weak colony over a strong one in spring with an excluder between the two, the weak one having the benefit of the heat from the strong one below.

3. Yes; if you unqueen a Carniolan colony, and then in 8 days kill all queen cells and give a frame of young brood from an Italian colony, you will find the Carniolan bees will raise cells on the brood given just as if it was their own brood.

4. Before making any wholesale change it might be well for you to try a few to see how it pans out.

Sections—Brood—Requeening

1. I have several supers of sections with partly drawn combs which are cracking. I haven't any warm place to keep them. Would they be all right to use next year?

2. When a colony is given an extra body for brood rearing, what is done with the brood when it is taken off?

3. When is the best time to requeen, before or after the honey flow? MICHIGAN.

ANSWERS.—1 They will do if no honey is in them. If they contain honey they are not likely to make first-class sections.

2. They may be used to help weak colonies, or to make new colonies.

3. Unless queens are failing it is better to wait till the flow is nearly over. To requeen before will check egg laying at a critical time.

Paste for Tin—Propolis

I would like to know what kind of paste to use to paste labels on tin pails, and is propolis of any value? If so, what is it used for? I have tried every kind of paste I could get, but I fail to make anything stick over night. MICHIGAN

ANSWER.—I am going to ask the wise ones at Hamilton to give the latest on this point. I use 5-pound pails and have no difficulty by using labels that reach clear around the pail and lap an inch or so, using common flour paste.

(The addition of a little honey or sugar when boiling the paste will make it stick more readily.

Propolis has been used to some extent in the manufacture of leather polishes. It is claimed to be superior to resin for this purpose.—Ed.)

Winter Feed

1. In which is the most food value for bees, a pound of sugar or a pound of honey?

2. Would two large frames of honey keep a swarm of bees till spring. MINNESOTA.

ANSWERS.—1. In actual practice they are counted equal.

2. They might till *early* spring, in a good cellar. As a general proposition, I should say no.

(It is best to provide more feed than needed than risk a short supply.—Ed.)

A Prolific Colony of Blacks

About the 25th of May I bought a colony of bees that were pure blacks. They were in an old hive about ready to tumble down, on home-made frames an inch shorter than the standard, and so solid that they could not be moved without tearing the hive to pieces. The bees were very strong and about ready to swarm. I took off one side of the hive and loosened the frames, which were well filled with sealed brood and honey. The old queen was killed and the brood divided in two parts and placed in two hives, each division being given an Italian queen. This was just at the beginning of dandelion. After the new queens had been laying about two weeks the brood was raised above an excluder in each case and the queens placed below with full sets of drawn combs. I extracted during the summer 295 pounds of alsike honey, and in the fall 80 pounds of aster honey from the two.

The queens kept the lower hive bodies full of brood all summer and the middle of August I took off the second stories of brood and made two swarms from each by giving queens. I now have six strong colonies with at least 40 pounds of honey in each hive, besides nearly four hundred pounds of surplus, all from one black colony bought at the beginning of the season.

My apiary averaged about 100 pounds per colony.

A. H. FAIRCHILD,
Bruno, Mich.

Nebraska Locations

An Illinois reader writes to enquire about locations in Nebraska. Where sweet clover is well established, Nebraska offers some attractive openings. In the eastern part of the State there are many places where white and alsike clover are grown extensively by the farmers. In some counties sweet clover is also grown as a field crop. In such a neighborhood, where all clovers are present, the beekeeper has a favorable situation. Add to these the heartsease and other fall flowers to be found along the streams and failure is seldom reported. Sweet clover seems to reach its highest development in nectar secretion in Nebraska and surrounding States. It is important that a location be selected where the acreage of sweet clover and other plants is large enough to insure success.

Winter and Bees

There seems to be quite a difference of opinions regarding wintering bees. I well remember reading what our late lamented friend, Doolittle, did by suspending a colony all winter, without bottom or top, and how well it came through the winter in his latitude. That reminds me of what I saw last winter in West Texas. A party of- us were deer hunting in December and while traversing one of those mountain ranges I discovered a small colony of bees in a box, which had been placed on the stump of the tree they had been taken from. The box had nearly fallen to pieces with age and the weight of a heavy limestone rock for a cover. My curiosity prompted me to look in, as it was in an exposed place and the mercury close to the bottom. I lifted off the rock and instantly several infuriated bees came out and ran my companion away; but the sight that greeted my eyes made my mouth water, and I immediately got out my knife and sliced off a large piece of white comb honey. The cluster was in view and appeared full of life as they gradually loosened up around the bountiful supply they had on hand. At that time, in Austin, the weather was barely freezing and my honey had all granulated and away up on that cold mountain top was that colony of bees in first-class condition and the honey not candied. I was about converted to the idea of a good hive and it full of honey.

WALTER W. DURHAM,
Austin, Texas.

Tobacco Honey

We are in a location where hundreds of acres of tobacco are raised every year. I have taken bees and placed them near the fields and they will store some honey from the plant some years. It is very dark, much like buckwheat in color, strong and very heavy body. Buckwheat is not my favorite honey, but I can eat it. Tobacco honey I cannot. It is very slow to granulate, and I have never seen it harden as other honeys will, even when well ripened and two years old.

W. K. ROCKWELL,
Bloomfield, Conn.

The Wisconsin Meeting

The annual meeting of the Wisconsin Beekeepers' Association was held on December 5 and 6, at Madison, Wis., with five affiliated county branches participating.

Papers were read by Walter Diehneld, J. D. Millar, H. L. McMurry, A. C. F. Bartz, C. W. Aeppler, N. E. France, J. A. Warren, H. F. Wilson, Jim Cherf and C. P. Norgard.

Action was taken towards requesting some changes in the Wisconsin foulbrood law.

Officers elected for 1919 were as follows:

President—Gus Dittmer.
Vice President—Rev. J. E. Cook.
Secretary—H. F. Wilson.
Treasurer—A. C. Allen.

Poison Ivy Again

In the December number of the American Bee Journal Dr. Bonney gives a prescription for poison ivy. In the case of my own family the following effected a cure of a bad case in 24 hours:

Take a hot flat-iron, just as hot as can possibly be borne, and apply to every bit of the affected portion. It must be applied to the bare skin, and no portion of the skin affected must be missed. Iron as you would clothes.

A. T. COPELAND,
Olalla, Wash.

CLASSIFIED DEPARTMENT.

Advertisements in this department will be inserted at 15 cents per line, with no discounts of any kind. Notices here cannot be less than two lines. If wanted in this department, you must say so when ordering.

BEES AND QUEENS

WANTED—Bees in lots of 5 to 50 or more colonies. J. F. Coyle, Penfield, Ill.

WANTED—50 to 100 hives of bees. Answer, Frank P. Blair, 1558 McCormick Bldg., Chicago, Ill.

FOR SALE—8-frame nuclei with young untested Italian queen introduced, to be delivered after May 1; safe arrival guaranteed; one-third with order, balance first of April; $5 each. Irish Bros., Doctortown, Ga.

FOR SALE—Leather-colored Italian queens, tested, to June 1, $2; after $1.50; untested, $1; $10 per dozen. A. W. Yates, 15 Chapman St., Hartford, Conn.

GOLDEN ITALIAN QUEENS and bees; honey-getters, prolific and gentle. Bees by the pound. Write for prices. J. W. Rice, Box 64, Fort Smith, Ark.

FOR SALE—30 hives of black bees in 8 and 10-frame hives, new and painted; for bulk honey, $6.50 per hive. J. T. Collins, Ludowici, Ga.

WANTED—100 2-pound packages leather-colored bees; untested queen in each package. Make me an offer. Walter Anderson, R. 2, Box 86, Eau Claire, Wis.

GOLDENS that are true to name. Untested queens, $1; 6, $5; 12, $9; 50, $35; 100, $67.50. Garden City Apiaries, San Jose, Calif.

BEES AND QUEENS from my New Jersey apiary. J. H. M. Cook, 1Atf 84 Cortland St., New York City.

FOR SALE—Pure 3-banded Italian queens, as good as you can buy with money, from June 1 to September 1. J. F. Diemer, Liberty, Mo.

FOR SALE—From 1 to 100 strong colonies extra fine strain Italian bees, with winter stores; select tested queens in 1-story 8-frame single-wall hive, standard full depth self-spaced Hoffman frames; nearly all wired. If sold before January 1, $8 each; same colonies on frames without hives, $6 per colony. The bees are free from disease. F. o. b. here. Wilmer Clark, Earlville, Mad. Co., N. Y.

FOR SALE—3-banded Italian bees for sale n 1-lb. packages, 2-lb. packages with queens; bees that produced for N. A. Kimery, of Liberty, N. C; $2,000 worth of red clover seed, first crop. The M. C. Silsbee Co., Avoca, N. Y., says: "Bees purchased of you last season produced better than $50 worth of honey per colony, 1918 crop." We refer you to above named parties regarding this statement. We breed strictly for honey-gathering qualities and beauty; last, but not least, for hardiness. We try to please our customers. Give your needs in first letter. H. B. Murray, Liberty, N. C.

QUEENS—Bees by the pound, 3-banded and Golden Italians. The best of either. They are hustlers, gentle, cap their honey white, are very resistent to European foulbrood. Now that peace has been declared, our boys will be home for service. We believe the express companies will be able to deliver promptly. So we are also quoting prices by express. Booking orders now, one-fourth down, balance at shipping time. By parcel post, prepaid, one 1-pound package, $2.90; 2-pound, $5; 3-pound, $7 By express, f. o. b. here, one 1-pound package, $2.40; 2-pound, $4.25; 3-pound, $6.25. Select untested queens, $1.50 each; tested, $2.50; select tested, $3 each; 10 per cent discount on orders amounting to 25 packages or more. Add price of queen wanted. Send for free circular giving details.
Nueces County Apiaries, Calallen, Texas.
E. B. Ault, Prop.

FOR SALE—Bees by the pound for early shipment; safe delivery guaranteed.
H. E. Graham, Gause, Texas.

FOR SALE—Italian queens and bees by the pound; early shipments; guaranteed safe arrival and no disease.
Brazos Valley Apiaries, Gause, Texas.

THREE-BANDED ITALIANS ONLY—Untested queens, each $1; 6, $5; 12, $9; 50, $35; 100, $67.50. H. G. Dunn,
The Willows, San Jose, Calif.

A NICE PACKAGE OF BEES—1-lb. package with untested Italian queen, $3.50; 2-lb. package with untested Italian queen, $4.50; 25 1-lb. packages or more (one order) with queens, $3 each; 25 2-lb packages or more (one order) with queens, $4.25 each. Reference, the Security Bank and Trust Co. of Wharton, Texas.
W. H. Moses, Lane City, Texas.

HONEY AND BEESWAX

QUICK CASH for extracted and comb; send sample, or describe and say price.
Bruner, 3886 No. Kostner Ave., Chicago

WE are in the market for honey and beeswax. Send best price on comb honey and sample of extracted honey. State quantities you have, also style, size and weight of package or section. Charles Israel Bros.' Co., Inc.,
486-490 Canal St., New York.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co.,
204 Walnut St., Cincinnati, Ohio.

FOR SALE—Clover, heartsease, No. 1 white comb, $6 per case; fancy, $6.50; extra fancy, $7; 24 Danz. sections to case; extracted, 120-lb. cases, 25c per pound.
W. A. Latshaw Co., Carlisle, Ind.

FOR SALE—Michigan's best extracted honey in packages to suit. White clover, raspberry, milkweed, buckwheat.
A. G. Woodman, Grand Rapids, Mich.

WANTED—White or light amber extracted honey in any quantity. Kindly send sample, tell how your honey is packed and your lowest cash price; also buy beeswax.
E. B. Rosa, Monroe, Wis.

WANTED—Comb, extracted honey, and beeswax R. A. Burnett & Co.,
6A12t 173 S. Water St., Chicago, Ill

FOR SALE—Fifty 60-lb. cans or extracted honey (clover and heartsease blend). Price on application. A. L. Kildow, Putnam, Ill.

FOR SALE—Choice buckwheat honey, in cans or pails.
W. H. Hyde, New Canton, Ill.

WANTED—Extracted honey, all kinds and grades, for export purposes. Any quantity. Please send samples and quotations.
M. Betancourt. 59 Pearl St., New York City.

WANTED

WANTED—200 colonies of bees to run on shares; good location and reference if required. A. A. Spears, Neiber, Wyo.

WANTED—A lady partner that knows how to handle bees. She must have some means. I have a 5-acre grove, a house and everything a woman would wish. Marriage in view.
Fred Van Hagen, Anaheim, Calif.

WANTED—To buy, 300 or more colonies of bees, preferably in northern Michigan.
Closson Scott, 408 Selmont St.,
Warren, Ohio.

WANTED—A No 15 Cowan extractor which has been slightly used or shopworn, but in good shape; also steam uncapping knife. Give description and price in first letter.
Otto Diestel, Elza, Ga.

WANTED—A number of colonies of bees in standard hives, either black or Italian.
F. M. Bowman, Arcadia, Nebr.

WANTED—Your old combs, cappings or slumgum to render into beeswax by our high steam pressure wax presses.
Dadant & Sons, Hamilton, Ill.

WANTED—25 to 300 colonies of bees or bees to work on shares.
E. A. Harris, Albany, Ala.

CABBAGE CUTTER, SIX KNIVES, slices all vegetables rapidly. Prepaid, $1; three for $2. Lusher Brothers, Elkhart, Ind.

WANTED—December, 1917, and January, 1918 numbers of the American Bee Journal. Will pay 10 cents per copy.
American Bee Journal, Hamilton, Ill.

WANTED—Foundation Machines. State size, kind, condition, when bought new, and price asked. Grand Haven Pattern Works,
Grand Haven, Mich.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices.
Superior Honey Co., Ogden, Utah.

WANTED—To work bees on shares, or buy; Wisconsin preferred. Answer, Wisconsin, care of American Bee Journal.

SUPPLIES

FOR SALE—200 4¼x4¼x1⅞ beeway supers for ten-frame hives; nailed, not painted; brand new; complete with sections, separators, etc., a a very low price. Write
L. W. Mundhenke, E. Dubuque, Ill.

ALWAYS the best place to get your supplies is at the same old place of H. S. Duby & Son, St. Anne, Ill. No one can beat us on price. Free price list.

FOR SALE— Cheap, a new electric motor, just right for honey house or work shop; 60 cycles, 1-phase, 110 volts, 12 amp.; 1 horsepower constant duty. Inquire of H. M. Leach & Sons, Hiram, Ohio.

FOR SALE—At a bargain: 200 8-frame hivebodies; 150 bottoms, 150 covers, 110 queen excluders and 25 lbs. Dadant's extra thin foundation. Write for prices.
F. E. Matzke, Juda, Wis.

FOR SALE—1000 Standard bee hives in flat 8 and 10-frame sizes; supers with sections; full depth and shallow extracting frames. Entire lot new and strictly first-class. I will sell in large or small quantities at low prices.
J. O. Hallman, Helena, Ga.

FOR SALE

FOR SALE—Barnes No. 4 saw.
R. E Hammond, Bethune, S. C.

FOR SALE—40,000 pounds of No. 1 extracted clover honey and 35,000 pounds of aster honey; both of extra light color, heavy body and fine flavor, in 60-lb. cans.
W. B. Wallin, Brooksville, Ky.

GIANT SPIDER PLANT—Great honey plant, seed 10c pkt. S. W. Terhune,
Wortendyke, N. J.

OUR PRINTING SERVICE is unexcelled. If you want labels, stationery or circulars, write for samples and prices.
American Bee Journal, Hamilton, Ill.

FOR SALE—Cedar or pine dovetailed hives; also full line of supplies, including Dadant's foundation. Write for catalog.
A. E. Burdick, Sunnyside, Wash.

FOR SALE—A nice little cotton farm, 60 acres; a good location for a beeman. Price, $1,200; $650 cash, balance on 5 years' time, 8 per cent interest. Joe. J. Widmer,
R. 5, Box 107-a, Franklin, Texas.

SONG—"The Plea of the Bee," or "The Honeybee Doing Its Bit." A song for the children as well as for the grown-ups. Sent to any addr on receipt of 15 cents.
The Cutting Publishing Co.,
910 Merchants Bank Bldg., Indianapolis, Ind.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
Superior Honey Co., Ogden, Utah.

FOR SALE—1 to 1,000 combs in Hoffman frames. Honey Bee Farm, Olathe, Kans.

FOR SALE—At a bargain, Oliver typewriter, No. 5, in perfect condition; used very little. Machine is as goo as new; cost, new, $57. For quick sale, $38.
Alfred Bentz, Granton, Wis.

FOR SALE—Finest quality clover and buckwheat extracted honey, in 60-pound cans.
O. W. Bedell, Earlville, N. Y.

FOR SALE—Two extractors, uncapping can, honey tanks, extracting outfit, hives in flat; all new. Would take small job press, bees queens or honey, new crop. Liberty Press,
Box 224, Shenandoah, Iowa

FOR SALE—1 book Practical Queen Rearing 15 back numbe of Domestic Beekeeper; all are in No. 1 shape and will send C. O. D Write Wm. Feier, Jr., Mason, Mich., R. 2.

SITUATIONS

WANTED—A position as apiarist by a beekeeper who is planning to emigrate to the United States. He understands the Dadant method of large honey production, speaks a little English and has a small family, which he would bring with him. Address
Valot-Barrey, Rue de Chevignerot, Beaune,
Cote D'Or, France

WANTED—Experienced man to work 82 colonies on shares; want an industrious man. This is a fine locality for bees, 1½ miles back of Columbia river. Address,
Mrs. L. Schmitt, Oak Point, Wash.

WANTED—All-round, practical beeman, one who understands queen-rearing and increase. Can begin in February. Salary and percentage. Virgil Sires' Bee Farms,
Congdon Orchards, Yakima, Wash.

WANTED—Will give experience and fair wage to active young man not afraid of work, for help in large, well-equipped set of apiaries for season starting in April. State present occupation, weight, height, age and beekeeping experience, if any.
Morley Pettit, The Pettit Apiaries,
Georgetown, Ont.

WANTED—Men of energy and character, clean habits, as helpers in our ten apiaries; over 1,000 colonies; 1918 crop over 100,000 pounds; best chance to learn; need one experienced man and students. Write immediately, giving age, height, weight, experience references and wages, *all in first letter.*
E. F. Atwater, Meridian, Idaho.

WANTED—Two brothers, both single, well experienced in apiary work, orchard and poultry raising, desire to purchase apiary, part cash to be paid down, or are willing to run apiary on shares or for wages. Both elderly men and trustworthy
H. R., care American Bee Journal,
Hamilton, Ill.

WANTED—A housekeeper from 30 to 45 years of age; also interest in bees.
Box 91, Charlotte, Iowa.

WANTED—By an experienced beeman, a steady position in an apiary.
C. B. Saunders, Merom, Ind.

MISCELLANEOUS

FOR EXCHANGE—A Ford car, late model, for bees or good bee supplies.
H. E. Graham, Gause, Texas.

PERFORATED Wooden Well Casing, made of redwood. The best and cheapest well screen made. Send for descriptive circular.
G. M. Hawley, La Mesa, Calif.

WANTED—To trade a $35 protectograph for a honey extractor and bee supplies, or bees. Same is new. Address A. Ebi, San Antonio, Fla.

FOR SALE—Lantern slides relating especially to beekeeping. We are preparing an extended series of slides relating to beekeeping subjcts for those engaged in public work. If you need slides to illustrat your lecture, tell us what you want and we will be glad to quote you prices. Slides can be furnished from nearly all pictures which have appeared in the American Bee Journal, as well as of numerous other subjects. We will also be able to furnish advertising slides showing apiaries, etc., with the name of beekeeper, for use in moving picture theatres Advertise your honey to your local people Everybody goes to the movies If you have a good picture we can prepare a slide showing your own apiary
American Bee Journal Hamilton, Ill

Overstocked Big Discount

25% Off Some Items

WILL SELL AT FOLLOWING PRICES WHILE STOCK LASTS

Massey Hives, one story	5	$14.25
Scalloped Separators	100	1.52
Hive Hooks	100	1.50
Super Springs	100	.85
Ventilated Bottoms, eight-frame	5	2.70
" " ten-frame	5	2.80
Division Board, standard	10	.75
Aluminum Wiring Tool	Each	.30
Rubber-Coated Gloves	Pair	1.20

THE KRETCHMER MFG. COMPANY

DEPARTMENT A

301 Eleventh Avenue **Council Bluffs, Iowa**

Queens That Will Please

Queens that are bred for business; hardy, long-lived, gentle and disease-resisting. They are as good as any and far superior to most.

They are bred from IMPORTED STOCK which produces a bee that is the best in the world for honey-gathering and non-swarming. They are now giving service in nearly every country in the world.

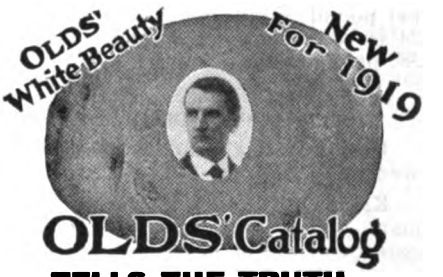
Have your orders booked now for early delivery. All that we require is one-fourth cash and balance when you are ready for the queens to be shipped.

WE GUARANTEE every queen to reach you in first-class condition, to be purely mated, and to give perfect satisfaction in the United States and Canada.

Prices—April 15 to July 1

	One	Six	Twelve
Untested	$1.25	$ 6.50	$11.50
Selected Untested	1.50	7.50	13.25
Tested	2.50	13.00	24.50
Selected Tested	4.00	22.00	41.00

L. L. FOREHAND : : Fort Deposit, Ala.



TELLS THE TRUTH

Olds' White Beauty is a new potato, now offered for the first time. It is very productive, outyielding well-known standard sorts, smooth and handsome and of very superior quality.

Write for Catalog

describing and illustrating this and other varieties **Potatoes, Corn, Oats, Wheat, Barley, Speltz, Soy Beans, Millet, Clover, Alfalfa, Timothy, Garden Seeds, Flower Seeds, Bulbs, Plants, Tools, Etc.**

ASK FOR FREE SAMPLES

High-Grade Field Seeds, showing purity and germination tests. Mention those interested in.

L. L. OLDS SEED CO. Drawer P 1 **MADISON, WIS.**

TYPEWRITER SENSATION

$3 or $4 monthly **buys** a Beautifully Reconstructed Latest Model Visible Typewriter with back-spacer, decimal tabulator, two-color ribbon, etc. Every late style feature and modern operating convenience. Perfect appearance, perfect action and absolute dependability. Sent anywhere on approval. Catalog and special price **FREE. HARRY A. SMITH (314), 218 North Wells Street, Chicago, Ill.**

BEES

We furnish full colonies of bees in chaff or single-walled hives, nucleus colonies or bees by the pound in season. Prices on application.

Ten-ounce screw-capped jars, two-gross crates, at $7.50 a gross.

I. J. STRINGHAM
Glen Cove .. New York

Crop Report and Market Condition

Compiled by M. G. Dadant

There is very little new to report. Honey appears to be in much lighter demand, with a consequent easing up in prices offered. There seems to be little desire, however, to sell below a price of 25 cents for best white extracted, with 2 to 5 cents less for amber. One California brokerage firm offers California amber at 23 cents and Hawaii amber at 19 cents.

Inbound shipments at New York are fairly plentiful, prices ranging at a little less than 20 cents for Cuban and Porto Rican honey.

We give below market report of the United States Department of Agriculture for December 30, 1918:

Honey Arrivals Since Last Report

Medina, Ohio—3,632 lbs. Florida, 31,900 lbs. Ohio, 42,000 lbs. Pennsylvania, 5,617 lbs. New York, 69,600 lbs. Idaho, 65.500 lbs. New Mexico, 800 lbs. Kentucky.

Shipping Point Information

San Francisco, Calif.,—Supplies light. Demand and movement slow; no change in prices. Cash to producer at country loading points, extracted, per lb., water white, 22-23c; sage white, 20-22c; white alfalfa, 20-20½c; light amber alfalfa, 19-20c; dark amber, 16-17c. Comb: Nevada 24-section cases, white, $6.50; light amber, $5.50; dark amber, $4-4.25. Beeswax, 36-37c per pound.

Los Angeles, Calif.—Supplies very light. Exchange now controls large share of honey remaining in producers' hands. Demand slow, little change in prices. Cash to producer on farm, extracted, light amber alfalfa, 19-20c per pound; light amber sage, 20½-21½c per pound. Comb: 24-section cases, No. 1 light, $5-6 per case. Beeswax, 36-38c per pound.

Telegraphic Reports from Important Markets

Note: Arrivals include receipts during preceding two weeks. Prices represent current quotations.

Kansas City—No arrivals. Supplies very light. Demand and movement slow, few sales. Sales to jobbers, extracted: 60-lb. cans southern amber, 25-26c per pound. Comb: No supplies on margket.

St. Paul—Home-grown receipts moderate. Supplies moderate. Demand and movement slow. Sales direct to retailers, comb: No change in prices. Colorados and Minnesotas, 24-section cases fancy, quality and condition good, $7.50-8.00. Extracted: prices lower; Minnesota, 60-lb. cans fancy white, mostly 25c per pound.

St. Louis—Supplies light. Demand light; movement slow. Sales to jobbers, extracted, per pound, Southern, barrels, amber, 18120c; cans, 20-21c per pound. Comb: No supplies on market. Beeswax, prime, 40c per pound.

Chicago—1 Colorado arrived. Demand and movement slow; little change in prices. Sales to jobbers, extracted: Western white, 25-26c; amber, 22-23c per pound. Comb: No sales reported.

Spokane—No arrivals. Supplies light, not cleaning up. Practically no demand or movement reported. Sales direct to retailers, Idaho, extracted: 5 and 10-gallon cans white alfalfa, 20-23c per pound. Comb: White alfaffa, 24-section cases No. 1, $7.25; No. 2, $7.

New York—212 barrels Porto Rico arrived. Supplies moderate. Demand and movement slow. Sales to jobbers, extracted: few sales Porto Rico at $2.30-2.60, mostly $2.30-2.40 per gallon. New York buckwheat, 22-23c; clover, 23-25c per pound. Comb: Very little market. California, very few sales. Light amber, 25-26c; white 25-27c per pound. Beeswax: 18 bales Porto Rico arrived. Supplies light. Demand and movement slow; little change in prices. Per pound, light, 43-44½c; dark, 42-43½c.

Philadelphia—Arrivals: Extracted, 102 cases of 10 gallons each and 47 kegs New York, 4 cases and 3 barrels Florida, 13 cases New Jersey; Comb, 162 cases New York, 767 cases Vermont; too few sales to establish market.

Cincinnati—1 California arrived. Demand and movement slow. Sales to jobbers, extracted: Few sales, white sage and sweet clover at 27-28c per pound. Comb: 24-section cases, No. 1 white, heavy, $7.00-7.25; fancy white, heavy, $7.25-7.50. Beeswax: Demand and movement moderate, No. 1. white, 40-42c per pound.

Cleveland—No arrivals, supplies not cleaning up. Demand slow, practically no movement; prices decreasing; few sales. Sales to confectioners and bakers. Extracted, western, 60-lb. tins light amber, 31c; white clover mostly 25c per pound.

Denver—Approximately 1,500 pounds extracted arrived. Supplies moderate. Demand light, movement slow. Sales direct to retailers. Comb: few 24-section cases No. 1 white at $6.30; No. 2, $5.65. Extracted: Light amber, 22-24c per pound. Beeswax: Cash to grower, f. o. b. Denver, 38c per pound.

Minneapolis—Home-grown supplies moderate. Demand and movement moderate. Sales direct to retailers. Comb: no change in prices. Minnesotas and Colorados, quality and condition fine, 24-section cases fancy white, $7.50 per case. Extracted: Prices slightly lower. California, quality and condition generally good, 60-lb. cans, 26-28c per pound; Minnesota, quality and condition good, 60-lb. cans fancy, mostly 30c per pound.

New Honey Label Catalog

It is a debated question whether honey will remain at its present price level when normal times come once more. The foresighted beekeeper is the one who will prepare for any contingency, by assuring himself of a steady market, regardless of price fluctuations.

This can best be done by developing the home market to its fullest extent and attractive labels on his packages are one of the most important things to consider when working up local demand for honey. They should stand next to superior product, and neat, clean packages.

Our new label catalog lists many distinctive labels which you will like. Write for your copy today. It is free. Beekeepers' Stationery is also offered.

AMERICAN BEE JOURNAL, Hamilton, Ill.

WESTERN BEEKEEPERS!

We handle the finest line of Bee Supplies. Send for our 68-page catalog. Our prices will interest you.

The Colorado Honey-Producers' Association
1424 Market Street, Denver, Colo.

BUY

THE FAMOUS DAVIS GOLDENS

And get big yields from gentle bees. Write for Circular and Price List.

BEN G. DAVIS,
Spring Hill, Tennessee.

VOL. LIX—NO. 3 HAMILTON, ILL., MARCH, 1919 MONTHLY, $1.00 A YEAR

BUILDING UP COLONIES IN SPRING

A Discussion of a Most Important Factor in Securing the Maximum per Colony of Production, by C. P. Dadant.

I DO not now recall which one of our educators in beekeeping made the wise remark that colonies of bees should be prepared for winter as early as August and September, by seeing that each hive had a good, prolific queen, and a sufficient amount of good honey.

If those two requisites are important to winter the bees, it follows that they are also important in building up the colonies in spring in time for the honey crop. A good prolific queen, in the early fall, will supply her hive with a plentiful stock of young bees before the inactive season comes. A strong colony will secure plentiful stores. So the requisites which make for good wintering provide favorable conditions in early spring.

Since the American Bee Journal has, among its readers, active beekeepers located anywhere from Quebec to Florida and from the State of Washington to Washington, D. C., advice upon building up colonies for the crop cannot be based upon any exact dates. The beekeeper must be acquainted with the flora of his district and plan his building up of colonies accordingly. In some localities the preparations will be made in January. In other localities the bees will be coming out of the cellar while the former are through their first harvest. But, barring the dates of the required preparations, the necessity of bringing colonies to the strongest possible condition for the crop is the same.

Many beekeepers of the old days believed that the worker-bees lived a year or more. The introduction of the Italian bees in hives of black bees made it plain to the masters that bees, in the busy season, do not average more than 40 days of actual life, and that about two weeks of that short space are spent in the hive, previous to active work.

The eggs laid at a given date by the queen require 21 days to hatch. The worker remains a week in the hive, growing stronger daily, then takes a first flight. Then she remains another week in the hive before becoming an active field worker. These dates may be a little lengthened by unpleasant weather. They may also be a little shortened by accidental circumstances. For instance, in a hive which has swarmed and lost most of its field bees, the young workers become field laborers earlier. The same thing happens if a division is made which leaves a colony with only young bees. Some people refuse to grant the bees anything but instinct. That instinct, however, seems akin to reason.

Since the average time required for the development of the worker-bee is 35 days, we readily see that the laying of the queens on an extensive scale must be begun more than 35 days before the opening of the crop. In fact, to succeed fully, the period of heavy laying should begin early enough to secure a large field force before the opening of the crop. This means the emerging of thousands of bees for at least a month previous to the honeyflow.

Several requirements must be complied with to secure not only active laying of eggs, but safe hatching of workers. Warmth is necessary. If the colony has a young, prolific queen, we may depend on her to do her duty, if she is fed, as she should be.

The scientific observers have noticed that the bees do not neglect the queen, but feed her as often as she appears to desire it, provided they have the food. The food given her, they say, is mainly royal jelly, which many of the bees prepare for the feeding of the larvæ. Whether the queen is fed on this jelly altogether or on pure honey also matters little. The bees feed her, it is clear, and this constant feeding induces the growth of eggs in her ovaries. In order that she may be fed plentifully, the bees themselves must have food in plenty and easily accessible.

Honey is the first requisite. But it needs to be of a thinner consistency than the honey which has been preserved through the winter. So water is also needed, both for the queen and the brood food. That is why we see so many bees at the watering trough or at the creek, sipping the moisture on every pleasant day. Colonies that go after water freely are sure to have much brood and an active laying queen. Our authorities agree that, at these times, if syrup is supplied in place of honey it must be given thin and warm. But syrup is probably not the best food for either the queen or the larvæ. Sugar syrup makes good winter food because it does not contain any large proportion of tissue-forming material, and therefore does not load the intestines of the bees. But in the spring the bees need more solid food for the tissue-forming of the young bees or for the egg-production of the queen.

Pollen is then indispensable. When no pollen is to be found, which is sometimes the case in early spring and especially in spots remote from woods, we have often replaced it with wheat or rye flour, or fine cornmeal. Some of the later scientists assert that it is not a practical substitute. But we have often supplied hundreds of pounds of flour to apiaries, and it has always been used freely until pollen appeared. The bees actually carry honey with them to dilute the flour thus given in boxes about the apiary.

When all the honey in the hive is sealed and nothing is found by the bees, in the fields, in early spring, we have found it advisable to uncap

some of the cells, from time to time, to excite their propensity towards feeding the queen. This is intensive beekeeping and is difficult to follow on a large number of colonies and especially in outapiaries. A light amount of feeding of the colony is also good to induce extra feeding of the queen by the bees. We know that some object to it, and it is perhaps successful only in instances where there is an interval between one early bloom and another. It is very important that the bees should not lessen the breeding previous to the heavy flow, and some means must be found to secure this continuous laying.

The difference in results between two apiaries is often due to the difference in the condition of the hives in the two months that precede the honeycrop. In the one case the bees have a sufficient supply of honey and in addition find, readily, pollen, water, and an occasional light flow of nectar such as dandelion or fruit bloom —not enough to store a surplus, but enough to enhance brood-rearing. The colony grows apace in numbers and when the real crop comes the supers are soon filled.

In the other case, the supply of honey in the hive may be scant, the pollen late, the water out of reach; the flow of occasional nectar is perhaps not to be had. The bees increase in numbers slowly and the heavy breeding begins only at the opening of the heavy honey flow. So the bees use up the honey they gather, in rearing bees that may be altogether too late for the crop and that will help in consuming the supply instead of having helped to gather it.

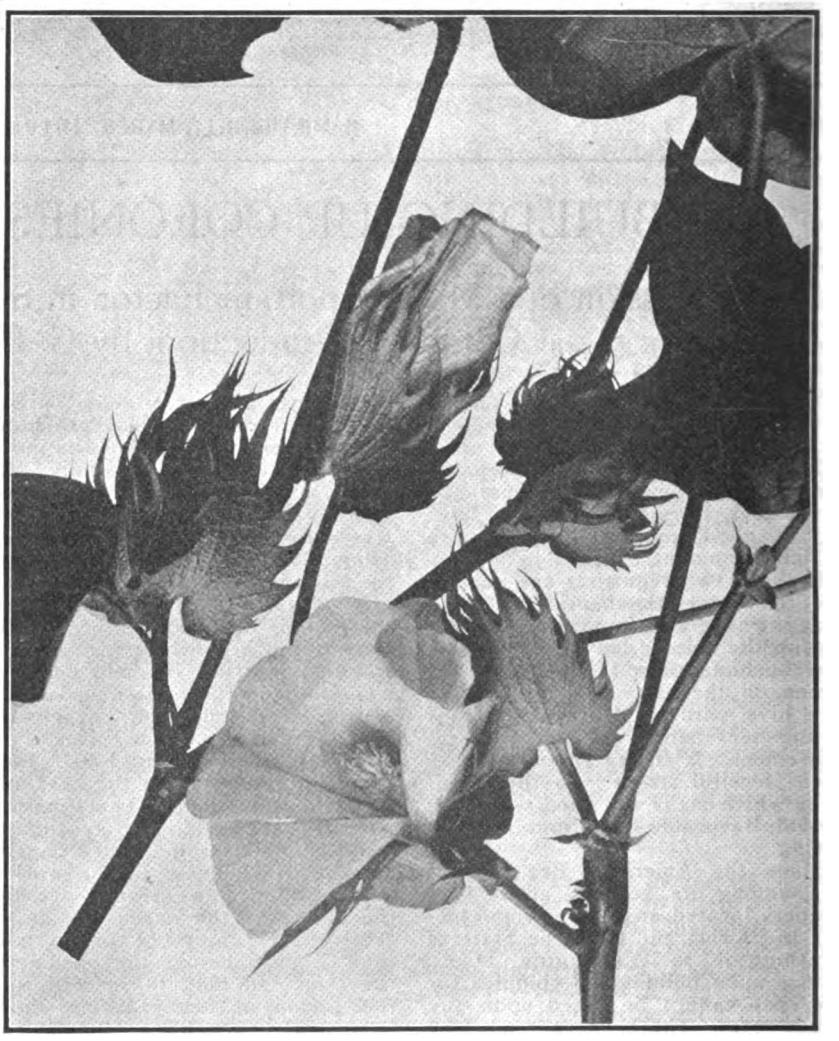
It may be advisable to insist, especially with the novices, upon the supply of honey needed to carry a colony of bees to the main honey flow. In some localities, when the fruit bloom flow comes, it is followed shortly afterwards by another flow of nectar. But in our locality, quite a space of time elapses, after fruit bloom, when there is nothing in the fields but pollen-producing bloom. Three weeks may elapse between fruit bloom and clover. Then is the important time to make sure of the bees having a sufficiency for breeding.

An inexperienced horticulturist who had studied a few bee books asked me once to sell him a hive of bees. I told him where he could get a colony cheaper than I could sell him one, and offered him, in case he made the purchase, to transport it to his yard and place it there for him. It was shortly after fruit bloom. In transporting the hive I noticed that it was very light, although strong in bees. After releasing the bees in the selected spot, under a fruit tree, I mentioned to him the probable necessity of having to feed them for a few days, till the clover honey flow. He looked at me with amazement. "What? Feed them now? When summer opens? I expected to get honey from them, not to have to feed them!" This was a damper on his bee enthusiasm from which he never recovered. Too many think the bees should make honey, just because summer is opening, and do not feel either willing or able to look after their possible wants at the critical time when a little support may save them and secure a strong force for the crop.

The honey flow is often of short duration. In our own experience, we have seen a honey harvest last under 30 days oftener than over that length of time. The colony that has a full force at the opening of such a flow may fill every available cell, not only in its brood-chamber, but in several supers. The colony which is only beginning its full and active breeding, at that time, will have a field force which may help only in consuming the little which was gathered.

One of the beekeepers of 30 years ago , Heddon, wrote: "The bee business is a business of details." This is true; the little details make or mar the success.

"Large streams from little fountains flow;
Tall oaks from little acorns grow."



Blossoms of the cotton plant. U. S. Department of Agriculture.

Honey From Cotton

By Frank C. Pellett

ALTHOUGH the cotton plant is found growing wild in many warm countries, in the United States it is known only as a staple field crop. It was brought to this country as early as 1621, and has been the most important plant grown on southern plantations since the early development of the country.

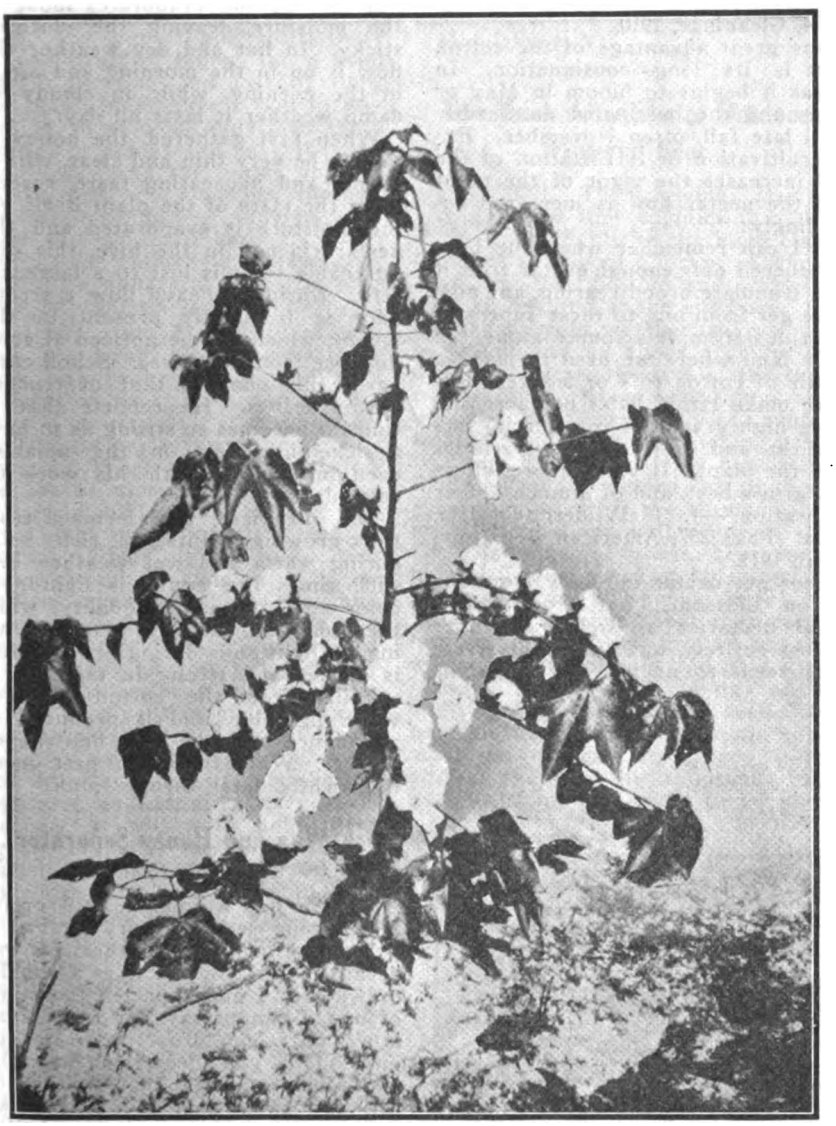
The plant thrives in a warm and humid climate, and needs five to six months of warm weather. However, it is grown successfully under semi-arid conditions in parts of Texas and other southwestern States. The so-called cotton belt extends from the northwest corner of Texas south to the Rio Grande, and east to the Atlantic seaboard. A limited acreage is grown in California, but, excepting very restricted areas, it is not important outside the territory mentioned. Texas, Mississippi, Alabama and Georgia, are perhaps, the most important of the cotton-growing States. The Carolinas, Louisiana and Oklahoma also grow it in large areas.

Honey production reaches its highest development in localities where good nectar-yielding plants are grown in large acreage. Hence we find beekeeping thriving in dairy communities, where alsike and white clover are grown abundantly. We also find the beekeepers prosperous

where alfalfa is an important crop. In the southern states, cotton is the one field crop grown on a sufficient scale to offer ideal conditions for the beekeeper. However, cotton is fickle in its behavior, and cannot always be depended upon to produce nectar, no matter how abundant the crop. In some cotton-growing districts the beekeepers swear by cotton, while in other localities they declare that it is of little value. The character of the soil seems to be a very important factor in the secretion of nectar by this plant. The vigor of the growth must be just right, and that don't come often. The honey is the same grade as most honeydews."

In contrast, we find the following report of good honey and abundant yield, in American Bee Journal for 1907, page 267:

"Cotton blossoms furnish a great deal of excellent honey, and the theory that it explodes or ferments is all bosh. It makes an excellent rich honey, oily, and it is not liked so well by some until they get used to it.—Jules Belknap, M. D., Sulphur Springs, Ark."



Cotton ready to pick. U. S. Department of Agriculture.

and the amount of available plant food in the soil are also important. Reports from different sections indicate that the quality of the honey varies in different sections.

W. D. Null, of Demopolis, Ala., wrote to the author as follows:

"This, you know, was for sixty years the heaviest cotton-growing section in the nation. Bees will not work cotton if they can work anything else, even bitterweed. It yields honey of very poor quality, and never very much, some years none at all. Weather conditions

When the writer made his first trip through Georgia he was much puzzled by the different reports of apparently good observers in different parts of the State. The matter was finally explained by a beekeeper who had lived in different localities, by the variation in behavior of the plant under different conditions. There is perhaps no important honey plant which varies so much, in the quality of its nectar, as does cotton. The poor quality in some places can doubtless be explained by the fact that the flow is not abundant, and is mixed with other low-grade stores. However, honeydew is also sometimes reported from the plant itself.

"Sometimes, during a damp spell, the cotton gets covered with vast numbers of aphis, and the upper side of the leaves will first get gummy and then will even drip a kind of dirty-looking sweet fluid. If there is anything else on hand the bees will not touch it."—W. H. Alder, Callallen Co., Tex., page 334, American Bee Journal, 1899.

It is needless to say that this would make a poor product, and it is not improbable that honeydew is sometimes secured from cotton in localities where it seldom yields nectar. The secretion is apparently dependent far more upon soil, than upon any other condition. Upon the black waxy lands of Texas and upon other soils, it reaches its highest development. The boundary of the belt, where cotton yields freely and where it does not, is very marked in Texas. North of the escarpment which runs across Bexar county, Texas, near San Antonio, it is an important source. South of that line few beekeepers report it as dependable. North of this line the soil is black and heavy; south it is sandy. Wherever the writer has found beekeepers on sandy soil, they have reported the yield from cotton as uncertain; while on the heavy soils they report it as fairly constant, with suitable weather conditions. The map shown herewith roughly outlines the heavy section where honey from cotton is important in Texas. Cotton is grown east, south, and, to some extent, west of that line. In east Texas, cotton is reported as yielding well on river bottom lands and but little on the hills. In the southern sections, and also in other States, an occasional crop is reported where it does not yield regularly:

"We had a very dry, sultry spell here the latter part of last August, and up to that time the bees were living from hand to mouth. All at once they began storing from the cotton bloom, though it looked as though cotton was going to die in the fields from drought and heat, yet it yielded until the bees had stored from 30 to 60 pounds per colony."—J. J. Wilder, Cordele, Ga., American Bee Journal, page 141, 1906.

On suitable soils it is one of the most dependable sources of nectar:

"The apiarist who has his bees located within range of extensive cotton areas can count on at least an average crop year after year, with more certainty than many of the other numerous honey yielders which we have."—Louis Scholl, page 652, Gleanings, 1912.

"My main sources for surplus are mesquite trees and the cotton fields, cotton being the second of importance in the central and northern parts of the State, or throughout the black land region. On sandy or light soil, cotton yields very little honey. * * *

"The yield is good, averaging about 73 pounds of bulk comb

honey per year. One year it was over 100 pounds. Honey from cotton is very light in color, the comb very white, and of excellent flavor when well ripened. As soon as cool weather sets in this honey fairly draws out in long strings, when handled with a spoon."—Gleanings, page 1313, 1907.

From the above it will be seen that cotton honey is of good quality, at least in some localities. Samples said to be from cotton from Georgia, are strong and of rather poor quality, while cotton honey received from Texas is light in color, of mild and rather pleasing flavor. The honey from cotton granulates very quickly. That produced in the southeastern States also has the effect of bursting the containers, possibly from the effect of fermentation. The humidity of the atmosphere evidently has a marked effect on the quality of the honey from this plant. The following reports indicate the quality:

"As to the quality of cotton honey, I can say from my own experience, that it varies in color from light amber to almost water white. While I do not consider it equal to white clover in flavor, it is superior to basswood. * * * The flow increases toward the last of the season, and if we can get two weeks of nice weather after frost it amounts to a considerable increase in the crop."—J. D. Yancey, Hunt Co., Texas. Gleanings, page 162, 1910.

"It did well on our rich bottom land and yielded a fair crop of the finest honey it was ever my pleasure to see. It was so thick that it was almost impossible to extract it, and entirely out of the question to strain it through a single thickness of cheese-cloth. It was light in color, mild in flavor, and very heavy, and in my opinion superior to any honey ever shipped to this locality, not excepting huijilla. The long drought and consequent absence of all other bloom enabled us to get a purer cotton honey than we had ever been able to get before. Again in the late fall, when the weather began to get cool, our cotton took a second growth, soon blooming profusely, and by accident we got also a fair fall crop."—O. Saunders, Trenton, Texas. Page 734, Gleanings, 1910.

One great advantage of the cotton flow is its long continuation. In Texas it begins to bloom in May or June, and the bees work it steadily until late fall, often November. Extra cultivation or fertilization of the soil increases the vigor of the plant and the nectar flow is increased accordingly:

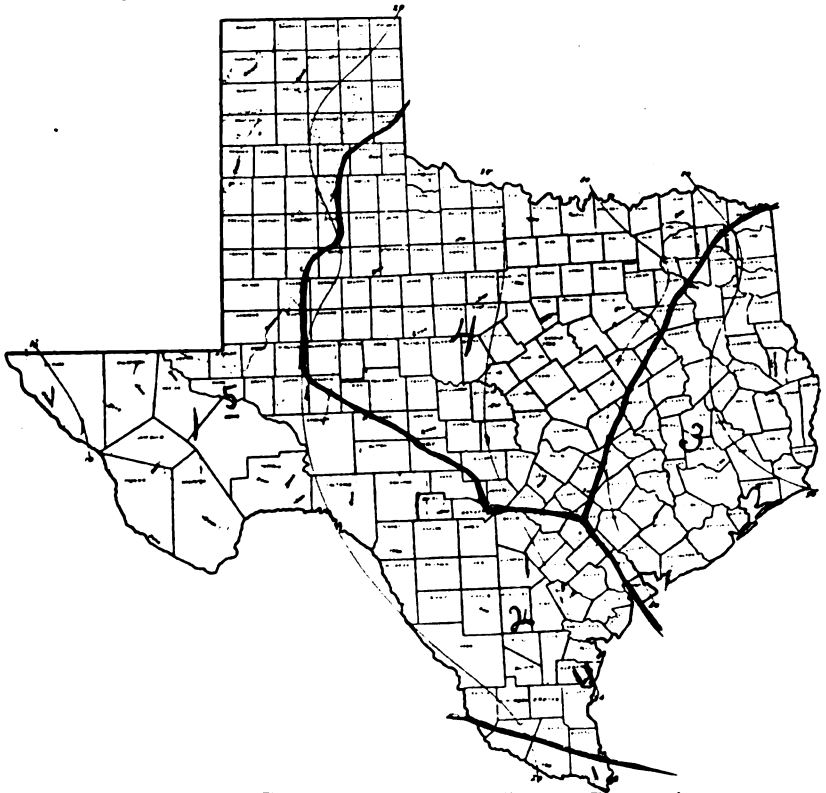
"I can remember when the bees gathered only enough nectar from it to stimulate brood rearing, and now we get from one to three supers of surplus from this source alone. * * On land where we used to make a bale of cotton to 4 or 5 acres, now we make 1 to 2 bales per acre, using high grades of commercial fertilizer and more prolific varieties of the plant. It yields more where it grows best, and of a much longer duration."—J. J. Wilder, Cordele, Ga. Page 237, American Bee Journal, 1911.

Bees get nectar not only from the cotton blossoms, but from extra-floral nectaries as well. At times almost entirely, and to gather freely they seem to neglect the blossoms from the extra-floral nectaries. Some of these are located under the flower and begin to secrete nectar before the blossoms open. Others are located on the under sides of the leaves, and vary from one to three on each leaf. When atmospheric conditions are favorable, these glands secrete abundantly and the nectar gathers in drops. At times it is so abundant that the men cultivating get their clothes saturated with the nectar, while following the cultivator, from the brushing of the leaves against them. Later in the day the heat of the sun evaporates most of the moisture, leaving the clothing sticky. In hot and dry weather the flow is on in the morning and again in the evening, while in cloudy or damp weather it lasts all day.

When first gathered, the honey is said to be very thin and clear, with a strong and nauseating taste, resembling the taste of the plant itself. As the moisture is evaporated and the nectar ripened in the hive, this disagreeable taste is lost to a large extent. During a heavy flow a strong odor is frequently present in the apiary, which can be noticed at some distance from the hives. Scholl compares this odor to that of crushed cotton leaves. He reports that at times it becomes so strong as to have a sickening effect on the apiarist, even interfering with his work on calm days.

The heaviest flows come from rank-growing plants on rich soils, during warm and wet weather. At such times the honey is lighter in color and superior in quality, while the honey stored from plants growing on light soils during dry weather is darker and strong in taste.

Pollen from the cotton plant is white in color, and is produced in abundance from the large bell-shaped flowers. When the bloom first opens it is white, later turning pink.



The honey-plant region of Texas:
1. The Rio Grande Valley region.
2. The mesquite region.
3. The East Texas region.
4. The cotton region.
5. The West Texas region.

A Wax and Honey Separator

By J. E. Crane

I HAVE had a good deal of prejudice for several years against a capping melter. Whether this was because I did not use it as I should or whether I had expected too much of one, I cannot say, for I had read how you could drop the cappings onto one as you sliced them from the well-filled combs, and at the end of the day have a nice lot of clean honey and a cake of wax ready for market. I found instead a lot of honey with more or less dirt in it and my cake of wax with either a large amount of dirt or slumgum mixed in with it, or a cake of wax where the dirt had settled to the bottom mixed with wax and saturated with honey. How to get out the wax and dirt and leave all the honey was often a question. Usually, I think, I tipped the cake of wax up on its side and let it drain until the next day. From some of the cakes I could scrape or chip off the dirty wax at the bottom and make them look quite respectable, fit to sell or ship to the manufacturers of comb-foundation. How

many hours and days I have spent in cleaning the bottoms of cakes of wax or in melting them over and straining to get rid of the dirt, I cannot say.

Now there may be something in locality, and bees not make as clean cappings here as elsewhere, that may account in part for my troubles, but troubles they were, and so serious that I had gone back to my old method of setting the cappings to soak for a day or two in water and then pressing them and using the honey water to dissolve sugar in to feed bees. Or, sometimes, we put them in 10-gallon cans and set in hot water to melt and rise to top of honey. But with all our efforts there was some loss of honey and a good deal of vexation and loss of time. How many times have I said to myself "Oh, if we could only melt these cappings or combs and have the wax go one way and the honey another and the dirt and slumgum another, how nice it would be." Having some leisure this winter, I have given the subject some thought and have constructed an apparatus that has produced very satisfactory results.

As I had a small quantity of cappings on hand, some granulated combs with broken combs and odds and ends of wax and honey to separate, I constructed a new melter that I might try my wax and honey separator. When through I had perhaps 150 or more pounds of honey and nearly 100 pounds of wax and six or eight quarts of dirty wax or slumgum. I was pleased to see two streams running hour after hour from the separator, one of wax and the other of honey, and at the end to have my dirty wax all by itself. I was especially pleased to see my cakes of wax so clean and free from dirt. In nearly 100 pounds of wax I do not think there was a thimblefull, all told. It was by all odds the nicest lot of wax I ever made. It works automatically and requires very little attention. It will work hour after hour, or day after day, with almost no attention except to draw off the slumgum or dirty wax occasionally.

As the warmed honey and melted wax drip into it from the capping melter, the honey being much the heaviest, sinks quickly to the bottom, leaving any dirt it may have carried with it from the melter in the wax as it goes down, while the pure wax, being lighter than the dirty wax, remains on the surface and the dirty wax sinks to near the top of the honey. As it accumulates it may nearly fill the space above the honey, and should be drawn off through the lower spout by removing the cork, after which the spout should again be corked tight. The honey cannot be drawn off with the dirty wax, because it is heavier and lies below it, and the pure wax need not be drawn off with the dirty wax, as it rests above it. Neither can the wax and honey run out together, for they are separated by a metal partition.

It works by gravity, the honey, wax, and slumgum separating of their own accord in passing through the separator, each taking a different position and making it easy to draw them off into different vessels. The apparatus is quite simple and should not be expensive. The slumgum is mostly wax with a considerable assortment of dirt, which should be melted up in water and strained, when a considerable amount has accumulated. In running off nearly 100 pounds of wax recently I had only six or eight quarts of this dirty wax to remelt, a small job compared with remelting a hundred pounds of wax and straining or scraping the dirty wax from the bottom of the cakes.

Middlebury, Vt.

Too Much Attention to Outdoor Wintered Bees

ABOUT Thanksgiving Day I packed four colonies in a dry goods box with the hives close together and about 6 inches of wheat chaff on top, bottom and all sides with an opening at the entrance. As we had no cold weather, they would come out and fly about a couple of days each week, the rest of the time it was rainy. About three days ago we had our first spell of winter weather, and as I was watching pretty close, I found that my bees were flying out at the rate of two or three every minute, with the thermometer at 20 degrees and with snow in the air. As none of these bees came back, I made a piece of fly screen to fit the entrance and put on each hive. The bees that found that they could not get out crawled around on the wire till they got cold and died. One hive had 35 dead the same day, one 6 and the other two about 15 each. The next morning two of the hives were much in earnest and were piled against the wire by thousands and were working like crazy to get out. I feared to remove the wire for fear they would pile out and die of cold, so I gave each a little smoke. One became quiet, while the other paid no attention to the smoke. At dark the screen was removed and the one which was the worst only had a few living bees. I found them in a hot mess of dead bees and honey all mixed. There is not a living bee left in that hive today. Do you think my bees were too warm?

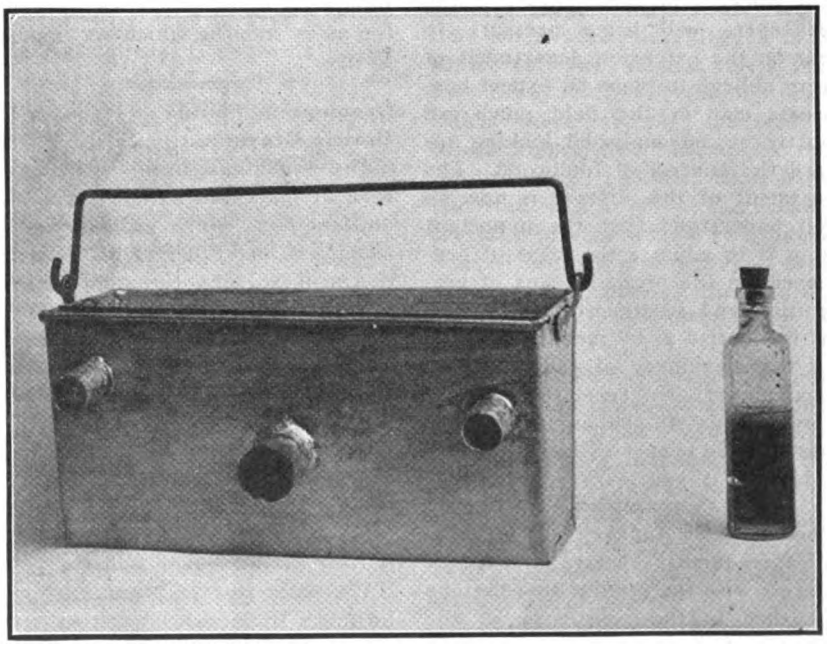
PENNSYLVANIA.

If there was no bad food, loading the intestines of the bees so that they were compelled to fly, this is simply a case of over-interference with the bees. They were so strong that an occasional bee would fly out. The loss would have probably been insignificant on that score if they had just been allowed to do as they pleased.

I have at all times noticed that the colonies which lose the most bees in the snow during the winter, from their insisting on taking flight when it is too cold, are the colonies that winter best, as the quantity thus lost is infinitesimal as compared to the tens of thousands remaining in the hive. Confining the bees against their will has never proven beneficial unless they may be confined so they cannot see the light at the entrance. Wire netting the entrance is the worst thing that can be done, even in shipping bees. If they are confined with netting, it must be over a space that allows the whole swarm to get to the light.

Of course, if bees are restless from bad food, that is another question altogether. In that case the condition gives but little hope of salvation.

In the very best colonies that I ever carried through the winter, the bees were warm enough that they would show themselves at the entrance in the coldest weather, if the hive was stirred ever so little.—Editor.



Crane's wax separator.

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language. Consolidated with The National Bee Journal in 1874.

Published monthly at Hamilton, Illinois.

Entered as second-class matter at the postoffice at Hamilton, Illinois.

SUBSCRIPTION RATES—In the United States and Mexico, $1 per year; three years, $2.50; five years, $4. Canadian postage 15 cents, and other foreign countries 25 cents extra, per year.

All subscriptions are stopped at expiration. Date of expiration is printed on wrapper label.

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THE EDITOR'S VIEWPOINT

A Mild Winter

Reports from many places indicate that the winter has been much milder than usual. Numerous reports express the fear that spring will find the bees short of stores and that feeding will be necessary. With bees flying nearly every day in January, it is not surprising that they soon began seeking for water and started to rear brood. Brood-rearing consumes honey very rapidly and beekeepers should have a care to make sure that all bees have plenty of feed. With bees in great demand and honey at high prices, it is poor policy to allow bees to starve for want of a little attention at the beginning of spring.

Education for Disease Control

In several of the States good results are beginning to be apparent as a result of the efforts of the extension workers in beekeeping. If the beekeepers will bring pressure to bear on the extension department of every college to place an expert bee-disease man in the field, much can shortly be accomplished looking toward the control of foulbrood. The treatment of this disease is now so well understood that the important thing is to educate the mass of beekeepers in the proper means of recognition and treatment. The short-cut to control is by means of utilizing the machinery of the extension departments. No special legislation is necessary. All that is needed is to convince the proper officials that such assistance is necessary.

When Articles Appear

We frequently receive articles of interest with the request that they be published in the next issue of the Journal. Our readers who have not had experience in getting out a publication cannot realize how impossible that may be. We often have several times the amount of good material there is room for and of course are limited to the 36 pages which constitute the Journal. It often happens that articles are set in type expecting that they will go in and then are crowded out for one, two, or even three months. We try to make use of as much of the material sent us as we can, and we very much appreciate the fact that our readers send us so many valuable contributions. We regret that it often happens that good articles are crowded out month after month. We try to publish all notices of conventions and other timely mention as quickly as possible. Questions for Dr. Miller's department are answered as nearly as possible in the order received. We have some good things on hand which we have held for many months which we hope yet to use.

Openings in Florida Orange Groves

The Cincinnati branch of the bureau of markets has had several enquiries from citrus growers on the Indian River, Florida, in regard to the posibility of interesting beekeepers in establishing apiaries in proximity to their groves. We are not informed as to what sources of nectar are available after the oranges have stopped blooming. It might be well for beekeepers interested in Florida locations to investigate this territory.

A New Sweet Clover Bulletin

We have just received a copy of Farmer's Bulletin 1005, entitled "Sweet Clover on Corn Belt Farms." This is a 28-page publication giving in detail the methods of cultivation of sweet clover as a farm crop. It is always to the advantage of the honey producer to encourage the growth of sweet clover as widely as possible. Those interested will do well to call this bulletin to the attention of their neighbors who are engaged in farming, as well as to write for it themselves. Address Division of Publications, U. S. Department of Agriculture, Washington, D. C., and ask for Farmer's Bulletin 1005.

War Losses by Beekeepers

We have so far heard very little about war losses by beekeepers in the devastated countries. It is probably due to the fact that beekeepers are usually farmers and that these were driven from their homes, compelled to seek shelter far away, and in many cases uninformed as to their actual losses, until they returned to the despoiled regions. Here is one account just received by us:

"Arriving home, I found my house blown open and without roof; the furniture was all carried away, as well as the cooking utensils, linen bed-clothes, etc. We live here like savages, without clocks, without furniture, without linen, without utensils in which to cook. Mother has no clothes left. We had to put a roof on the kitchen and it is there that we live. We have less to eat than during the war and have just been 4 days without bread. No lights to the windows and no coal, and the weather is cold. The bees have been carried away; they have even stolen the empty hives. I had 10-frame hives and 20 skeps."

"ELIE LEMAIRE,
"Haussy, Nord, France."

Our Americans have been very generous; they have donated and are still donating, to the Red Cross, to the Belgian and Serbian relief committee, to the Y. M. C. A., the Y. W. C. A., the fatherless children of Belgium, France and Serbia, etc. But there is still an immense amount of suffering and room for help from generous hearts. The above is an instance among the many. The suggestion has been made that a subscription be opened among American beekeepers for their suffering brothers of Europe. The funds could be placed in the hands of some leading European Association for distribution to the needy. But the sub-

scription should be worth while. What do the American beekeepers say?

March Beekeeping

While in the South the bees are beginning to make honey, in some places preparing to swarm, in the Middle and Northern States March is the most critical month of winter. Many a colony which has apparently done well through the cold months begins to dwindle in March. The hive may be short of stores, if not well provided in the fall, or the bees, while rearing brood, may make too many trips for water in a half sunshine on cloudy days and become chilled before getting back home.

Sometimes a remnant of winter, a few days of exceedingly cold weather compels the bees to again shrink the cluster to the compactness of cold weather cluster. If the weather continues cold, they may starve with honey almost in reach.

At this time, more than at any other, populous colonies prove best. They eat less than weak ones, keep their brood warm and can afford to lose a few bees of those who venture out after water and early pollen.

If they are plentifully supplied with honey and breed vigorously, the bees may be kept contented at home if a little thin, warm syrup is given them in the evening. They should not be fed in day time, for fear of inducing robbing.

Do not remove bees from the cellar until a warm day comes. If possible, put the colonies back on the stand they occupied before winter. We have very positive evidence that some of them, at least, remember their fall location.

A French-Canadian Bee Magazine

"L 'Abeille" (The Bee), a 12-page magazine in the French language, made its bow to the beekeepers of the Province of Quebec in January, too late for review in our February number.

"L 'Abeille" is published under the patronage of the Ministry of Agriculture of the Province of Quebec, by Mr. C. Vaillancourt, chief apiarist of that Department, at Quebec.

It is too early to judge of the future of this magazine. But we know that the Province of Quebec, in the short summers that it enjoys usually furnishes as much honey, to the bees, as some of our most favored regions. To illustrate this, we will quote from a private letter to us, from Mr. Jacques Verret, concerning the past summer, which was very unfavorable:

"Our crop has been poor, an average of 30 pounds per colony, with an increase of only 35 on an apiary of 89 colonies. The colonies sold brought $15 each and the price of honey is from 25 to 28 cents per pound. For the year 1919 we are asking $21.50 for colonies of common bees and $25 for Italians."

If we figure that the expense of hives and supplies for colonies amounted to half the selling prices, which is certainly sufficient, there was still a profit of over $10 per colony, spring count, on this Quebec apiary in a season much under average.

This indicates a thrifty condition and is surely an inducement for the beekeepers of Quebec to sustain a magazine devoted to their industry. We wish the new magazine good luck.

A New Interest in Bees

There never was a time when our educational institutions were giving so much attention to bees as now. More than half of the agricultural colleges now support beekeeping courses. Boys' and girls' bee clubs are becoming popular and beekeeping short courses and conventions are matters of every-day occurrence. Following the California series of short courses for commercial honey-producers, the University of New York offers a similar course. Short courses of a more general nature are also offered at Kansas and Ontario Agricultural Colleges. It is expected that several other States will announce such courses for the spring months.

In times gone by conventions were infrequent and the journals reported the proceedings rather fully. To do that now would be an impossibility, since state and county meetings of beekeepers are held everywhere with increasing frequency.

A Franco-American-Palestine Beekeeper

We quote the following from a letter of our old friend Ph. J. Baldensperger:

Nice, December 2, 1918.

Received your kind letter of November 2, a few days in advance of the number containing my article on Punics, and was glad to see that you appreciate fully my views, in another article from your pen.

We have them at last; thanks to the Yanks, in a great measure, and we have our Alsace-Lorraine back again. When I was a boy, in Jerusalem, I heard that ghastly music of the "Sedantag." I went to France in 1875 and enlisted for five years, hoping to take back the lost provinces. But it was too soon. Back to the Orient, in 1881, I first read the American Bee Journal and Gleanings, when I met D. A. Jones and Benton. Then I became engaged to an American young lady and married her in 1884.

This sealed my alliance with America. Now the dream has come true. Vive la Republique Universelle.

How much I was touched by the letter of Sevalle, in the September number, I cannot express; but your broad views on our future humanity almost surpassed me. Yet I heartily thank you for your idea of inviting all beekeepers at one table, not omitting * * * Berlepsch and Dzierzon. That was grand, at a moment when the armistice was not yet signed, not yet in view.

We are expecting your President, and hope peace on earth will be restored for good.

Thanking you once more, I am,

Ph. J. BALDENSPERGER.

Downward Trend of Prices

As this is written newspaper reports announce a sharp decline in the piece of butterfat, with the further statement that a second drop is to be expected shortly. Several other articles show a downward trend. As yet there has been no decided drop in honey prices, owing to the fact that the supply in the hands of the producers has almost been exhausted. A few concerns are offering honey at slightly lower prices and it is not to be expected that the present extremely high quotations will hold for another crop. There never was a time when beekeepers needed to organize as now. Within a few years past honey sold at ruinous prices, which were shortly followed by prices higher than the most optimistic thought possible. It is highly important just now that the beekeepers take prompt action to stimulate interest in the use of honey as a staple product to prevent the return to the disastrously low levels of the recent past.

When the new crop starts to move the test may come. If there should be a decided break in market prices it may be hard to raise again to a living scale. Beekeepers should study advertising during the coming months as never before. We don't expect war prices but we must have a profit above the cost of production. We cannot afford to let the public forget to ask for honey.

BOYS' AND GIRLS' BEE CLUBS

An Account of a Most Successful Bee Club Which Under the Leadership of Charles A. Boyle, is Attracting Nation-wide Attention.

ONE of the most practical educational enterprises of recent years is the boys' and girls' club work. The success of the corn clubs, pig clubs, calf clubs and canning clubs has been remarkable. The bee club offered some more serious obstacles, but it has remained for Charles A. Boyle, of Kansas, to make it a success. Boyle is the district club leader at Emporia, and became interested in the possibilities of bee clubs early in his experience as a club leader. Several bee clubs were started by others only to fizzle out, or had secured a very moderate degree of success. The difficulties became more apparent after the work was under way, and he decided that the bee clubs are of sufficient importance to justify specializing with them. Mr. Herbert Popense, County Agent, has actively co-operated with Mr. Boyle.

To avoid possible disappointment, boys or girls whose parents did not already have bees were not encouraged to take up the bee club work, but rather something with which they were already familiar. The design was not to induce more people to keep bees, but to improve the beekeeping on the farms where bees are kept. The results are particularly striking, because the work is being carried on in a county where there was, at the time the clubs were organized, no commercial beekeeping. Most of the bees were kept on the let alone plan. As is usually the case in such communities, no way of production was known except to put sections on the hive and take what the bees placed therein. In a good season, a super or more of honey was secured; in a poor season, nothing. Swarms were the rule, and the profit shown by the bees was not such as to encourage a large investment in beekeeping. The enthusiasm shown for the bee club was not great the first season. It was necessary first to demonstrate the possibilities of beekeeping with up-to-date equipment and methods.

The club was organized in the spring of 1917 with twelve members. On the advice of Mr. Boyle, all joined in the purchase of an extracting outfit, which was carried from place to place and used by the members as needed. This reduced the expenditure for equipment much below what would otherwise have been necessary.

The leader was wise in inducing the members to begin by producing extracted honey, for the production of comb honey is a skilled operation, successful only in the hands of an expert. The purchase of a partnership extracting outfit also, by reducing expenses, made it easier for some of the boys to get started.

The writer enjoyed two days spent with Mr. Boyle and the club members last June. The zeal of the members was contagious, and he returned home very enthusiastic for bee clubs. A good leader is essential, for there are so many perplexing problems, which the novice is called upon to meet, that he is likely to become discouraged if left to himself. Mr. Boyle makes frequent visits to the members and assists them with their problems. One boy says: "I am thinking about getting some of my chums to go into the bee contest next year, as we get acquainted with so many boys over the country when we have club meetings. Then Mr. Boyle, our County Club Leader, takes such an interest in us that it is a real pleasure to take an afternoon off and go with him to see what the other fellow is doing."

Who doubts but that this boy gets a lot of fun from his bees?

The parents all seem as enthusiastic as the club members, appreciating the value of the effort on the part of the youngsters. The success of the first year can be measured somewhat by the membership of the second year, increased from twelve to fifty, only three of the second year members failing to complete the season's work.

The boy who has bees in a standard hive at the beginning has an advantage as far as the showing from his crop is concerned, but he misses some experience which the box-hive member gets. As soon as conditions are favorable, the bees in boxes are transferred to standard hives, with full sheets of foundation. The members are required to keep an accurate record of the cost of the whole transaction from the beginning to the end of the season. The value of the colony is estimated at the start, cost of equipment added, and this is deducted from the value of the honey harvested, to show the actual net profit secured. The members are thus given a sample of good business methods. They are furnished with blanks to be filled out at the close of the season, showing in detail the practice followed, amount of increase and honey, price for which it was sold, kind of equipment used, etc. In addition, each member writes a story of his beekeeping experience, following an outline furnished by the leader.

The boys like to compare notes on frequent occasions.

The girls are as enthusiastic as the boys.

These reports make interesting reading. The boys tell intimate experiences which are worth while, in addition to the profits from their venture. Except in a few cases, the members paid all expenses for new equipment, and showed a substantial profit besides. Although the past season has not been favorable for honey production, being below the average, the extremely high prices prevailing have been very encouraging to those who have had honey for sale. The first prize winner, Dale Stout, showed a profit of $39 from his colony, with 130 pounds of honey sold at 30 cents per pound. Since his colony had paid for itself the previous year, his venture showed no expenditure. Edward Palmer came next, with a total income from his colony of $37.50 and an expenditure of $3.85, leaving a profit of $33.65.

Clarence Morlok has reason to be proud of his record, as he was able to produce 113½ pounds of extracted honey from his one colony, while his father only had 200 pounds of comb honey from 14 colonies.

One boy was ridiculed by a neighbor for taking up with Boyle's newfangled notions. This boy produced more than twice as much honey from his one hive as the neighbor did from fifty colonies. "He who laughs last laughs best."

When Samuel Wingert decided to join the bee club his father was not much impressed, and thought he could buy enough honey to last the family two years with the money the boy proposed to put into new equipment. Mrs. Wingert sided with Samuel, and he started out to see what he could do. After paying back the money which his mother advanced to buy the hives, Samuel's bees did so well that the best colony showed a profit of $19.30, with the second one nearly as good. Samuel is to be congratulated in justifying his mother's faith so abundantly the first season.

Edward McMilland, Clarence Gladfelter, Lester Ptacek, Edwin Collins and James Morris all showed a profit of at least $18 from their best colonies. Some of the members had only one colony, while others had several. The contest was for largest production from one colony.

The Emporia Gazette called the club members "the Honey Bunch," and gave an extended account of the season's work. The influenza epidemic prevented the display of the product, which had been planned for early fall.

There is no means of estimating the value of such work among the young folks. They are taught the best methods of caring for the bees, and whether they keep only a few colonies to supply the family table or take up beekeeping seriously, they will be prepared to get the largest return for the labor expended. In spite of the fact that the boys were in a contest to show the largest production, one boy writes that he left an extra super of honey on the hive for safety in wintering. He reasons that, if it is not all needed, he can remove it at the beginning of the honeyflow next June. Here is an important lesson for many an old beeman. With prices ruling high, there is a constant temptation to remove the surplus too closely and thus deprive the bees of a sufficient reserve with which to build up early the following spring. Many a good crop is lost because the beekeeper is too short-sighted to provide for next season at the close of this year's crop.

The members of the Lyons County Bee Club may rest assured that the American Bee Journal is watching with much interest the growth of their club. The writer expects to visit them again in the future. We confidently predict that some of the members will make expert beekeepers, who will produce honey by the car load ere many years.

Progressive Beekeeping in Mexico

By P. Provensal

IN November, 1917, I had the pleasure of making the readers of the American Bee Journal acquainted with some of the conditions of beekeeping in Mexico and the chances of success.

Perhaps in these times of food shortage and economy, when such great efforts are made to produce a sufficiency for the world, a detail of a two years' experience in Mexico will illustrate the possibilities of beekeeping as a "side line," in order to increase the production of honey.

First let me repeat what I find in "The Hive and Honey-Bee" by Langstroth and Dadant: "The sooner those abandon beekeeping who consider the proper care of their bees as too much trouble, the better for themselves and their unfortunate bees." I believe that beekeeping, for the beginners as well as for the professional beekeeper, is a science of detail, of daily attention and of constant study.

Having had occasion, during my travels as professor of the French language, to visit a number of well-managed apiaries and to be present at diverse manipulations, I became convinced that those alone who take enthusiastic interest in the bees, who care for their apiaries and look after the needs of the colonies, can be successful in beekeeping

After settling in Uruapan, where many fruit trees grow, such as orange trees, citrus fruits, etc., I concluded to buy a hive of bees. At the same time, I read several bee-books: "Las Abejas," by J. De Boer, a well-printed book with abundant illustrations, sold for $1 by the Agricultural Department of Mexico; "Bees," by Dr. E. F. Phillips, of Washington, Farmers' Bulletin No. 447; "First Lessons in Beekeeping," by C. P. Dadant; and lastly "L'Apiculture Moderne," by A. L. Clement.

A little later I bought from a "ranchero" some 20 hives similar to those

Mr. Boyle makes frequent visits to the members of the club and assists them with their problems.

shown on the cover page of the American Bee Journal of July last, tree logs, square boxes, etc. The first ten hives were brought to me on the backs of donkeys, with an experience similar to that related by my friend Brenner, in San Domingo, page 194 of June, 1918, but with poorer luck, for he had them all delivered in good condition, while I lost four of mine through the breaking of the combs and daubing of the bees with honey. The other 10 colonies were delivered in good condition, having been brought on the backs of human porters, at great cost.

I transferred all those colonies after the method described in Dadant's "Bee Primer," into movable-frame hives, with very good success and the honey which I saved in the transfer was sufficient to make up for the four colonies lost in transit.

I then increased my colonies by artificial divisions, and succeeded quite well, so that in March, 1918, I had 50 colonies and had more than doubled my capital, besides averaging about 20 pounds of honey per colony and at total of 30 pounds of beeswax. I do not know of any business in which the profits can be so large in so short a space of time.

I do not wish to go beyond 50 colonies, first because I am a "side liner" and have other occupations. Besides, I am as yet uninformed as to the real resources of the country, in honey. I will learn more during the present season, which began in September and will end in March.

In the picture shown (cover page), the covers have been removed from the front rows, so as to show the style of hives which I use.

The parts which support the hives are intended to keep them out of the moisture, for in the rainy season it rains every day, and the soil is constantly damp.

My apiary is in the suburbs of the city of Uruapan, in a garden planted with divers fruit trees, as are all the gardens in the vicinity. We have several important sources of honey, chayote and chayotello, which yield white honey; later the orange trees and other citrus fruits, but it is difficult to have honey specially from one kind, as all bloom about the same time.

The roofs of my hives are made with thin shingles, "tejamanil," much as are used all through Mexico, on cottages. The temperature of the hives is much lower under them than it would be in the open sunshine, in this hot country.

Uruapan, Mexico.

Getting Colonies Ready for Honey Flow

By Joseph S. Scott

I THINK that I have read somewhere that the bees should be at a certain point of development, in the spring, after the winter's decline and that they should reach this point just as the honey flow comes. Is this so? Will a week later or a week sooner do? I think that all will concede that if the bees in a hive reach their highest development or the point in question a week later than the beginning of the honey flow they will certainly not gather the crop that could have been gathered had they been at this point a week sooner. Now let us suppose that they reach this point a week before the flow comes, what will the result be? Can they be held at this point? Will a hive of bees that reaches this point stay there for a week and then gather a full crop of honey, even though they show no inclination to swarm?

The club leader insists on full sheets of foundation, wired combs and up-to-date equipment. These boys will make expert beemen.

I don't think so. I think that we have got to get the bees in a certain condition to gather honey and that if the flow is a few days later or sooner than this point of development we will lose a large part of the crop.

What this point is that I am talking about I can hardly say; but it is at a stage where there are more bees fit for the field than at any other time. The point is reached by certain things; first, the daily laying of the queen, the proportion of eggs to larvæ, to nurse bees, to field bees, and there i only one time for it after the bees start their activities in the spring. A few days later may show more field bees, but more of them may be required as nurse bees, or, in other words, where there are more field bees there is a shortage of nurse bees, and so no more, nor probably as many, field bees would or could go to the field.

"There is a tide in the affairs of men which, taken at the flood, lead on to fortune." Is it not true of bees

I know that this spring I stuc pretty close to 200 hives of bees an all had plenty of stores; in fact, took a lot away from them afte spring had opened, and they wer getting a little scattering nectar. O the 31st of March I wrote to a frien of mine and told him this: "If th tupelo comes tomorrow week (Apri 8), I think that my bees will be in position to get every drop there is.' Instead of the 8th, tupelo began o the 4th. I put a hive on the scale and on the 5th they gained 5 pounds on the 6th 7 pounds; on the morning of the 7th it was raining hard an rained all day and turned cold tha night and there was heavy frost with high, cold winds for three o four days, and the bees did not ge out until about the 14th. A few hives swarmed the following week, but here is my crop record: Out of three yards, with 70 hives in each, one yard had three hives with a super full each, one yard had four hives with one to two supers full each, and one yard had six hives with a super or two each, and the rest of the hives in these yards only gave me an average of five pounds to the hive.

Now, there you are! Thirteen hives gave me an average of at least 40 pounds to the hive and the rest gave me an average of about five pounds.

Thirteen hives against one hundred and ninety. I know that these were not in any better shape than the rest. I am not certain, but suppose that they were not in as good shape when the flow started, but developed to this point during the cold spell, and so were in shape to get this honey when it warmed up, while the other hives, that were in better shape, had passed this point of development and so went to pieces, or did not get honey that was there for them to get.

If I am not correct in my deductions, will some one please explain this to me:

Why is it that of two hundred hives of bees in fine shape, only thirteen gather any surplus to mention, after a week of unfavorable weather?

Could the queens, during the three or four days of the beginning of the flow, have taken a spurt of laying that would give a very much larger number of larvæ to feed, that this increased number caused too many old bees to act as nurse bees? Or could the bees, after being confined to the hive for a week, sulk and refuse to take much part in gathering a crop?

I do know this much, I lost my spring crop with plenty of bees to gather it, and would like to know the reason why.

I also would like to know what I could have done to prevent this or a recurrence of it. It is very probable that such a case will come up again, as the weather is always very uncertain in arly spring when tupelo is due to bloom, and if I can "hold the bees" I want to know how.

While the cold spell caused a few to swarm, out of the 200 only about

25 swarmed, which I think is not unreasonable when you think of 200 hives ready to gather a crop. It is very reasonable to suppose that that many would get the swarming fever over being crowded and having to stay in the hives inactive for nearly a week. At least I looked for more to swarm.

I can look ahead and judge very closely when tupelo will begin to yield. I can also get my bees in a very fair shape to get this honey when it comes; I will never hope to have any bees in any better shape to gather a honey crop than I had mine last spring.

They had the bees, they were not short of room. All were run for extracted honey and all had mostly drawn combs. Those that did not have full supers of drawn comb had at least 80 per cent drawn comb and the other 20 per cent full sheets of foundation.

I have come to the conclusion that the psychological moment for the bees and the honey flow did not come together; that is, the bees were kept from working for a week and when they did work, the chance had gone. Counting out those that swarmed I still had a percentage of 87 that were in fine shape to get the nectar, but only 7 per cent did get the nectar.

Mt. Pleasant Ala.

BEEKEEPERS BY THE WAY

Demuth explaining the mysteries of the hive.

A Great Beekeeping Teacher

When a fellow settles on his life work early, he gets a good start toward his goal, while his schoolmates are experimenting with various possibilities. George S. Demuth took up beekeeping at 14 years of age and paid for his first colony by making fires and cleaning the school house at 5 cents per day. It took 110 days' work to raise the $5.50 necessary to get that first hive of bees. It took the savings of another long period to get the dollar necessary to pay for a year's subscription to the American Bee Journal. To the impatient boy, the period between the time when the dollar was sent and the first copy arrived was one of the longest in his life. From a neighbor he borrowed Gleanings so as not to miss anything worth while in the way of beekeeping lore.

With a net increase of three swarms and the sale of $6 worth of honey from the one colony the first year, the venture may be regarded as successful.

We next find him rigging up a home-made saw, with a mower wheel to furnish the power, to cut out sections from basswood cordwood. Later he made hives for all his neighbors and soon was embarked in the supply business on a great scale—for a boy. The time soon came when the supply business was a nuisance to him, because it interfered with his beekeeping, and he dropped it.

Demuth is one of the most expert honey producers in America and has practiced migratory beekeeping in Indiana for more than twenty years. In the natural order of events he was selected as State Bee Inspector of his State and served in that capacity for three years before he went to Washington as Assistant Apiculturist in 1911.

Those who have seen him at conventions and short courses are enthusiastic about his work as a teacher of beekeeping. Seldom do we find the practical and theoretical so fully combined in the same individual. Demuth is a great beekeeper and a great teacher.

Bee Paralysis

By H. Brenner

ABOUT eight or ten years ago I read for the first time of the damages wrought by paralysis in Australia and saw descriptions of whole townships totally swept clean of bee life as a result of it. About four years ago, in early spring, in our home apiary, about one-half of my own colonies became affected with it, but without serious resulting harm, as the disease soon disappeared of its own accord without any treatment of any kind by me. This caused me to study the disease to ascertain the reason why in Australia the colonies should be killed out and why in my home yard only a few were affected, and even they soon shook off the symptoms of the disorder.

My records showed that those affected by the disease had been fed at the end of January and early February with a thin honey and watery syrup. We had reduced one part honey with three parts of water and had made a very thin nectar-like solution. It happens that we extracted these colonies late in the previous fall, honey being in great demand and very high in price in our local market. We noted that every colony which we fed in the early spring for brood rearing developed symptoms of paralysis. At that time we fed with Alexander feeders, and I noticed after a few days of feeding that there was a smell as of vinegar or fermentation in the apiary, but at the time I paid no very great attention to it, as the bees seemed to be doing very well and brood rearing went right along with apparently good results. When, later, the paralysis became apparent in the yard it gave me the first idea that soured honey might be the cause of it.

During a visit to California three years ago, one of my hosts called my attention to a bad case of paralysis in one of his apiaries. I remembered my own experience and advised him to fill some combs with fresh sugar syrup and put it in the brood nest. He did so and the disease immediately disappeared.

Last year I came across an article by our Mr. E. G. Le Stourgeon, in one of the southern agricultural papers, disclosing May sickness, or bee paralysis. Le Stourgeon knows the theories and writings of every writer on bee culture, so that he can quote verbatim from Crane, Dr. Miller, Doolittle and other authorities, and he swears by them. In consequence, he referred to and described the bacteria theory, the apparent epidemic nature of the disease and such cures as the sprinkling with sulphur, etc., but he inclined to the belief that excessive dampness in the hives, causing moldy combs and damp air, was the cause of the disease. I told him that this was not the case with our Texas and southern California paralysis, and I believed it was nothing but bad stores or fermented nectar, which are only used by the bees when there are no good stores to be had, that cause the disorder. We argued quite a while over the matter

till I proposed to take the stores out of a strong colony and feed some soured nectar to prove my contention as to the origin of the malady. We selected a strong, healthy colony and in a few days I produced for him a perfectly typical case of paralysis. We had good luck, too, for the experiment, as we had a spell of bad weather during which the bees could not fly and bring in new, fresh nectar from the fields. The bees will positively not use inferior or damaged honey if the hives contain good food, or if a source of supply is available. If the bees upon which we tried this experiment could have brought in nectar during this time I do not think the disease would have appeared, as the nurse bees would not have used the soured stuff we furnished them. They will store any sweet available at any time, but will use only the choicest for brood rearing.

After it was established to the satisfaction of Le Stourgeon that I could produce the disease at will he raised the point that where the disease was a menace to beekeeping it had been described as being of a more or less epidemic nature and that some had even claimed it was contagious. I then took the combs from the diseased colonies and gave them to others in the apiary which had plenty of stores and at the same time gave the diseased colony some sealed frames of honey and a frame of freshly made sugar syrup.

The result was the immediate recovery of the diseased colony, and none of the others developed the symptoms or appeared in any way affected by harboring the diseased combs . This disposed of the contagion theory and the epidemic feature.

So far as our portion of South Texas is concerned, and considering my experience in Southern California, I would say that there is no use being at all anxious about this disease, as the smallest amount of good, wholesome honey or nectar furnished to an affected colony will immediately stop its course. In fact, in our own apiaries we do not pay any attention to it, as we have always, in fair weather, some nectar coming in. The presence of new nectar, or of good, wholesome stores, causes the disease to immediately disappear without any aid or manipulation on the part of the apiarist. Often, late in the fall, and sometimes in the early spring, we cannot prevent the bees from gathering sour syrups or sweets that will sour from fermentation, such as decayed fruits, melon rinds, etc.

The above observations cover my knowledge of the disease in the South. I do not doubt at all the experience so often described by others, and it may be possible that there are two diseases with practically the same symptoms. The best authorities on bee culture seem to feel pretty well assured of the epidemic, if not actually contagious, nature of the disease, and some of them place its origin in a specific bacillus as a well demonstrated fact. They may be correct, but I feel thoroughly convinced that I have discovered the cause and cure of the disease, as I have seen it.

One thing I wish to partiularly emphasize, in my belief that it is the use of soured honey in brood rearing that causes the disease, is the fact that I have never noticed a nonplumaged bee to have the swollen abdomen and other symptoms. I think that only the nurse bees are affected and then only when they are preparing food from unfit stores for the young. The young brood is also not damaged in a colony having the disease, and apparently it is while the soured nectar is in the stomachs of the nurses that the harm is done.

E. G. Le Stourgeon says:

"Our own experience has been that this disease only appears in damp weather, or just after a protracted rainy spell, and usually upon examination of the affected hive we have found it to be one of the most populous in the apiary and that some of the combs are musty from lack of ventilation. This suggested open ventilation and sunshine as a cure and many experiments have proven it. Our opinion is that soured or partly soured honey is eaten by the bees, causing the paralysis above described. A few days of good hot sunshine will usually check the trouble. The cure can be aided by transferring into a dry, clean hive and providing plenty of ventilation. Especially is it well to raise the hive off the damp ground."

If Mr. Le Stourgeon's plan of treatment should prove equally effective in other hands, beekeepers will owe him a debt of gratitude, especially those living so far south that bee paralysis is a very serious matter. But it need not be wondered at if there be some skepticism in the case, since so many cures have heretofore been offered with great confidence, only to fail when tried later. The sulphur treatment has been given, not because very certainly known to be infallible, but because endorsed by O. O. Poppleton, one of the reliable veterans of great experience.

"The statement that bacilli are to blame for the disease is given on the authority of Cheshire, who, on page 568, Vol. II, describes the disease and says that in every case he has found the diseased bees filled with a bacillus that he has named Bacillus Gaytoni. It may not be out of place to remark in passing that even if Mr. Le Stourgeon should be entirely right as to sour honey causing the disease, that by no means establishes an alibi for the bacillus in question."

C. C. M.

(Let us add, also, that the Isle of Wight disease, which is very similar to paralysis, and to the May disease of the European continent, is certainly a contagion for which the "nosema apis" has been held responsible. We are still in the dark on all these points.—C. P. D.)

Introducing Virgins

I HAVE just been reading the American Bee Journal, and find an article with this heading: "Care of Queens," by C. C. Miller, where a correspondent asks: "Could you not give some advice in the American Bee Journal as to how virgins should be handled from the hatching cage to egg laying?"

The doctor and the editor seem to think it is rather a knotty problem to introduce virgin queens. (January American Bee Journal, page 17.)

Allow me to answer that question.

Let us suppose I have 12 virgins, all hatched. I want these queens introduced just as soon as I can do so, but some other work may delay the game, and I won't have the time to spare until some of them are 4 or 5 days, perhaps 8 or 10 days old. I don't worry about them, having them caged with plenty of food in the cage.

When I have the time to do this little stunt of introducing, I go to a strong colony, touch them up a little with smoke, knock a few times on the hive to let them know I'm coming, so they will eat a little, and be in good humor when I get inside. I first look for the old queen and place the frame she is on outside of the hive opposite the side I am working, so she will be safe. I have a box made of screen wire the same as bees are shipped in when sold by the pound, with a hole in the end of the cage, the wood part, which admits a large funnel, 12 inches at the top, tapering to about 2 inches at bottom. This funnel is placed so the small end will go down through the hole in the cage for 3 or 4 inches, so the bees can't find their way out. The box also has a large lid for removing the bees when desired. Be sure and have this funnel-box ready before doing anything with the bees.

When the frame with queen and adhering bees is placed gently outside, lift out another frame that is well covered with bees and shake them off the comb into the funnel, so they will all tumble down through the hole into the cage. Then get another frame covered with bees, and do likewise. Then put the queen back where you got her and close the hive. Proceed to another strong colony and do the same thing; keep going till you have about 3 quarts of bees in the cage. I never take more than 2 frames of bees from each colony. Bear in mind the bees that go through the funnel are so frightened that there is no danger of their quarreling.

Now take out the funnel and close the hole so the bees can't get out.

Take this cage of bees to the cellar, or any dark, cool place, and leave them there for about 24 hours. I have been successful by leaving them there for only 8 or 10 hours, but I believe 24 hours is safer.

Have in readiness 12 small boxes about 6 inches square, with an entrance about 1 inch long by three-eighths of an inch deep, covered with screen wire; drive tacks in the bottom of these small hives, so that they

will extend up from the bottom one-fourth of an inch. This is for 3 1-pound sections to rest upon, close to the back of the hive. Have one section full or honey; the other two empty; or have the center one empty anyway.

Place these small hives where you want them, 3 or 4 feet apart. Now get your virgin queens, cages and all, place them in a basket, or in your pockets. Then get your cage of bees that is in the cellar, carry it out to the little queen-mating yard, set your caged bees down, sprinkle them with water, just enough so they cannot fly; shake them up and down in the cage till they all look pretty wet (of course not too wet). Now take the lid off the cage and scoop out about one-half pint of bees and drop into the little hive. Shake one of your virgin queens in with them and close the hive. The next day take away the screen wire from the entrance and your little swarms will go to work. In about a week you will find a nice laying queen.

As soon as you find eggs in the combs, remove the queen, and introduce her to a stronger nucleus or full colony; for if you leave her with such a small colony she seems to get dissatisfied, and some way disappears. I generally start new colonies with these small ones by placing the 3 sections, bees, queen and all, in a standard-size hive and give them a frame of hatching brood from some strong colony. Just set the sections in a row, along beside the frame of brood, and slip in a division-board. You can soon build these nuclei up to good strong colonies by adding brood and honey occasionally. Of course, you can make these nuclei as large as you wish at the beginning. I only suggested one-half pint of bees for convenience. But don't give them any brood or eggs, for they will sometimes kill the virgin queen if you do.

I consider this method absolutely safe for introducing virgin queens, or laying queens, and I believe it is the best and safest way to introduce queens of great value. These small nuclei can be made with wire screen bottoms so, when the queen is removed, you can unite them with another colony, if you wish, by placing them in an empty super over the colony, having the wire cloth bottom next the frames, and leaving them thus for two days. Then smoke them a little and release them. I find this a pretty good way to introduce the new laying queens. Of course, I kill the old queen first, or about 24 hours before releasing this small nucleus.

RAY MOORE, New Salem, Ill.

Fumigation for Bee Disease

HAVING observed that modern disinfecting for disease is generally carried out by means of fumes and not by sprays, this set me to thinking as to what gas to use for Isle of Wight disease, the first symptom of which seems to be "crawling," and then the bees disappear; in fact, the symptoms seem to be similar to what I read lately in one of your papers about 'Disappearing Disease." I decided to try the fumes of chlorine as given off by commercial chloride of lime, known also technically as 35% bleaching powder. In 1917, early June, I saw my bees crawling about the walks, so on the principle of "kill or cure" I laid half a teaspoonful at the hive entrance and awaited results. Greatly to my surprise and delight the bees seemed to quite approve of the perfume and apparently tasted the chloride, at the same time fanning furiously. On seeing such a result, I put a ridge of about half an inch in front of the hive entrance, so that every bee entering or leaving had to pass through the fumes. Crawling ceased in a day or two and my stocks did well as long as the good weather lasted and came through the winter well. Here I may say that our bees are wintered in the open and fly any fine day; mine were all flying on the 15th of December.

Along last spring I cleaned the alighting-board frequently with a solution of chloride till May. In June I got a new stock, which had swarmed on the 6th, and it did very well, and all was right on the 18th, when the weather broke down, and from then until July 3 they did little but keep themselves. The morning of July 3 being fine, I went to inspect and found this lot crawling in all directions. I at once put down chloride, and things became normal in a couple of days. The summer continued the worst on record, however, and I did not get a good harvest, but, as already said, these stocks are all well today.

When I discovered this disease I went round my neighbors, to find any number of stocks similarly affected; most cases were sudden, but three had been bad some time. In cases where chloride of lime was applied, crawling ceased, same as with mine, and a small crop was gotten. In cases where no chloride was laid, crawling ceased in 6 to 8 days so long as the queen was getting plenty, but the disease broke out again later on honey flow failing, and in one apiary I know of, these non-treated stocks are now dead—about 6 stocks.

The three cases of undoubted Isle of Wight were in the hands of good, keen men, and in addition to the outside treatment they put about one-quarter ounce doses inside the hives fresh every week and also fed lightly. In all three cases crawling ceased, and today bees are alive and apparently doing well.

The results obtained here make me venture to suggest that some beekeepers, better up in the strengths of disinfectants than I am, and able to follow up with research, might try the effect of these fumes in a pure state upon old combs, without bees, known to have had foulbrood.

In any case, it is my intention to fumigate all my combs with gas before I put them into my hives next summer, for wherever a spore finds its way the gas can penetrate, too; but not by any means is this the case with an atom of spray which is much larger, and I also think it might be worth a trial to give small doses to the stocks themselves.

T. T., Broomend, Scotland.

(We submit the foregoing, though we have but little faith in drugs. Yet, Chas. Muth, Hilbert, Bertrand, Cowan and Cheshire have succeeded with them, after long battles. We have thought enough of their success to mention their methods in the "Langstroth Revised." But for popular, positive success, we know of no method that will succeed except destruction of the combs, in American foulbrood. Isle of Wight disease does not exist in the United States; the disease paralysis is not of long duration, neither is it as damaging.

Great Britain is trying all sorts of drugs, if we judge by the advertisements in the British Bee Journal: "Izal," "Yadil," "Bacterol," etc., have all been praised, but has success crowned the efforts? We will be glad to hear of further experiments.—Editor.)

Bees in National Forests—Best Bee State

"I would like you to advise me through your valuable magazine which is the best State of the United States for beekeeping. Is California or Florida considered better than the others? Can one use the vacant Government lands of the National forests for beekeeping?"

Ontario.

There is no one particular State which enjoys special advantages for beekeeping. Florida is probably one of the poorest of the States for commercial honey production. There are a few favored localities where commercial beekeeping can be successfully followed in Florida, but in general it is not a favored locality.

California is one of the best and there are numerous localities in California where beekeeping is very successful. However, in most parts of California it is necesary to practice migratory beekeeping to some extent and move the bees at least to one new field each year. Some beekeepers move two or three times. Unlike many eastern places, it is not generally the case that a man can find a location where he can get two or more good honeyflows in the same location in the same year.

There are limited parts of nearly every State that are specially adapted to honey production and other sections where it is not commercially profitable.

Texas, New York, Michigan, Colorado, Idaho and Montana are among the well-known honey-producing States. Kansas and Nebraska also offer some very good locations, with, at the same time, large areas not suited to beekeeping.

The government encourages beekeeping in the National forests and offers exclusive rights to the ranges at a nominal price of 10 cents per colony. There are some very favorable locations unoccupied in the National forests and one need have no fear of being crowded out of a good location, for he is protected absolutely by Uncle Sam.

Maple Honey Co.'s apiary at Antigo, Wisconsin. This is a pleasant spot to spend a summer

A Wisconsin Apiary

Our illustration shows a very attractive apiary in the woods of Northern Wisconsin. The Maple Honey Company, of Antigo, Wis., has never had less than an average of 100 pounds per colony in that location. The yard is well protected by the hills on the north, east and west, and on the south a "sugar bush" of tall maple trees furnish both shade and nectar. The hills and surrounding fields are filled with dandelion and white clover, and basswood is abundant in the nearby forests. Raspberry yields abundantly for several weeks and the season is rounded out with flows from buckwheat and goldenrod in late autumn. Aster and fireweed added to the long list of honey plants insure that no season will bring failure.

During the past season 85 colonies in the yard shown averaged 187 pounds per colony. In the picture may be seen some hives that are six stories high. These gave a surplus of more than 300 pounds each. This is one of the yards belonging to Cherf and Leykom.

Summer Management

By H. D. Murry

IN reading the beepapers one cannot fail to note the effect that locality has upon the necessary management of bees. This idea is brought out by a careful perusal of the very interesting article by Mr. G. C. Greiner, on pages 19 and 20 of the American Bee Journal of January. What most impressed my mind was his closing paragraph, in which he says:

"The secret of my heavy yields, expressed in a nutshell, is simply this: Brood-chambers should never be disturbed during a honey-flow. I never open a hive from the time spring management is completed until the following spring unless it is strictly necessary."

Now, if your valuable journal had no circulation in the south, I should not say a word. But we already have too many beekeepers in the southland who keep bees in some such way as that, and that is largely responsible for the low average production of surplus honey per colony in Dixie.

I do not know just how much manipulation is indicated by Mr. Greiner in his term "spring management," but too many readers are liable to interpret it to mean, **Put on supers in the spring and let 'em alone.**

The most successful beekeepers in the south find it necessary to perform many manipulations during the course of the season. We hardly ever, I might say, have a continuous honey-flow from spring to fall; but our season is cut up into several short flows. This may bring about swarming, either at the beginning or end of any one of these flows. This makes it necessary that we know, practically all the time, what is going on in each brood-chamber. In order to know this it is necessary to make examinations from time to time. About the only exception to this rule is in the case of introducing a queen of the current season's rearing. In that case, we think that colony is not apt to swarm during the first honey-flow after her introduction, and it is not necessary to examine that colony again, unless some abnormal conditions arise with it.

A colony may not be doing the work in the super that we think it should, and we may think it needs requeening with a better queen. It may be doing good work in the super, but is getting extraordinarily strong. It might develop the swarming fever, so we examine to find out and take steps to prevent, in case we find it building queen-cells. Also, we usually desire to make more or less increase during the season, and this calls for work in the brood-chambers. There are so many conditions to be met that the most progressive beekeepers in the south have generally settled down to some system of frequent examination and manipulation of the brood-chamber. This is made all the more necessary by the fact that all commercial beekeepers have a number of outapiaries. They must be so managed as to have a minimum of swarming, or the results at the end of the season will inevitably show a balance on the wrong side of the ledger.

Mr. Greiner doubtless finds his system of management satisfactory in his locality; but taking the country at large, I doubt if the same system will prove profitable in many locations. I think Dr. C. C. Miller bears the palm as the most successful comb-honey producer in the United States, and from reading his book, "Fifty Years Among the Bees," I get the idea that he does quite a bit of manipulating combs in brood-chambers during the honey-flow.

Mr. Greiner was not attempting to give us a complete outline of his management, or tell us exactly what he did to each and every colony; but taking the information as he has given it to us, it appears that the colony that gave him the best yield in 1918 was the one that he manipulated the most. He at least increased that colony a little more by the extra manipulation than might have been otherwise. Then, there is that swarm. If that had occurred at an outyard during his absence, he would most likely have lost that, together with the 55 pounds of surplus honey it put up. Such swarms would be frequent in the south, and we strive to prevent them by periodical examination of brood-chambers and whatever manipulation may be indicated by the examination.

Ladonia, Texas.

A Simple Feeder

By C. B. Palmer

TAKE pulverized sugar and honey (1 pound of honey to 2 pounds of sugar), knead them into a stiff dough; work in all the sugar you can. When your wrists give out you will know when you have enough sugar in. Now make this dough into pies one-half inch thick, sprinkle a little of the sugar in the bottom of a common bucket, put in a layer of the dough, or one pie, and a little more sugar, and another pie until all are in. Now you are ready to feed. Get from your grocer a lot of empty cigar cans. He will be glad to have you take them out of the way. Remove the cover and press as much of the dough into the can as possible. They hold 3 pounds of the food. Open the hive and turn this can bottom side up over the bee-escape hole in your packing super; or, if cloth is directly on top of the frames, then cut a small hole in the cloth and put the can over this hole. Now place the packing

material snugly around the can and the job is done, and you have fed and not disturbed the bees in the least. At any time you wish to know if more food is needed just tap on the can slightly and you can tell. I use old broken pieces of honey or sections that are unsaleable or are not fit for baits; mash them right into the sugar, comb and all. I leave these cans on until late, and have frequently found comb built in them. The heat penetrates into the food and it does not get cold or too moist, but just right all the time. If the can should become empty just remove and put another one on. The honey dissolves the sugar, with the aid of the heat.

Bradshaw, Nebr.

Hermaphrodite Bees

By W. J. Sheppard

ONE of the beekeepers in this district has just been telling me of the unusual experience he had with one of his colonies in 1917. During that year, and again in 1918, large numbers of malformed bees were thrown out of one of his hives. On making an examination of these bees, as many as thirteen distinct and curious combinations were observed. Some of them had a worker eye on the left side of the head and a drone eye on the other, and some just the reverse. Others were perfectly formed drones as far as the petiole (the tube connecting the thorax with the abdomen), the abdomens from that point being in every way the same as workers, including the sting. Others again were just the reverse of this. These monstrosities all emerged from worker cells which were capped in such a peculiar manner that they could all be recognized before hatching out. There was apparently nothing radically amiss with the queen otherwise, as the colony built up rapidly in the spring. At this time five nuclei were made from the hive, and now comes the remarkable and strange part of the story. All these nuclei have repeated the same phenomena as the parent colony, similar types of malformed bees having been thrown out of every one. Here, therefore is direct evidence of a well-defined, although undesirable, trait or characteristic, in a queen being transmitted to her next succeeding generation. A theory advanced, when the occurrence was first observed in 1917, was that possibly the old queen might have been mated with a drone emanating from a laying worker.

Nelson, B. C.

A Colorado Plan for Winter

In Colorado and the mountain States where there is much sunshine during the winter months, the tendency is to winter the bees in the open without winter protection. With frequent flights the bees come through, though the colonies are often badly weakened.

Daniel Danielson, of Brush, Colo., writes us that he finds it desirable to give some additional protection for the winter months. He sums up the necessary conditions for successful wintering in his locality to be:

Strong colonies with plenty of stores.

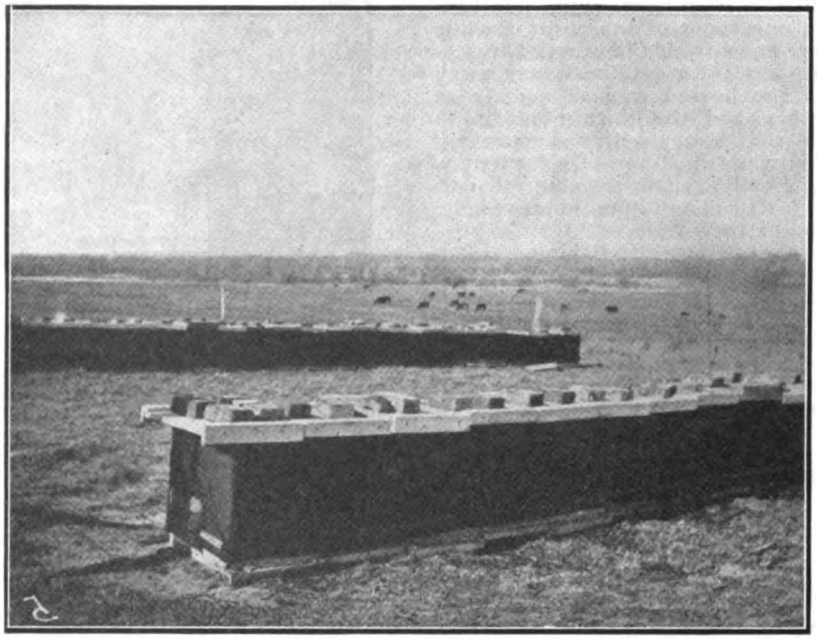
Two-story hives with upper heavy with honey.

Sealed covers to prevent loss of heat.

Additional protection from winter winds.

He has practiced wrapping in tar papers for ten years past and is well pleased with results. The hives are moved close together in long rows, as shown in the picture. It should be noted that the hive entrances alternate, one facing one way and the next in the opposite direction, to prevent mixing of bees. The bees cluster near the bottom of the upper hive-body, thus getting away from the entrance and consequent drafts. The cost is small (he figures it at about 8 cents per colony), and the time required is short.

For the Colorado climate Mr. Danielson feels that this method of wintering is very satisfactory.



Daniel Danielson's method of wintering in Colorado.

Extracting at Central Plant

By Morley Pettit

WHEN I decided in favor of carrying an extracting outfit from yard to yard, it consisted of a hand-extractor, capping can, cold knives, strainer and barrels for containers. The honey was seldom taken home, but shipped from the nearest railway station. With such conditions the hauling home of supers and honey, when neither needed to go, would have been out of proportion to the moving of such a light extracting outfit, even if more rapid transportation than horse-power had been available.

The increase of labor-saving machinery, with the decrease of labor, increased the difficulty of moving and set me looking for a better way. The advent of the Ford truck turned the trick. Contributing factors have been the problem of extracting houses, our system of blending and clarifying by gravity, change of selling package and of method of selling, and a growing desire for more regular life than continued outapiary work permits.

To enlarge on points in the last paragraph, I always looked out for an unused dwelling in an orchard for an apiary site, thus securing an extracting house and shade for the hives. This combination can frequently be found, but not often enough in combination with other desirable features to suit extensive beekeeping. Our store-tanks hold 2,500 pounds each. We have a sufficient number to fill two a day and still let each stand for at least three days for blending and clarifying before filling into selling packages. The latter are 10-pound pails almost exclusively. It is obviously not desirable to leave honey in such accessible form in an outapiary building. Our present method of selling requires shipping in lots of a few hundred or thousand pounds from day to day, so shipments are all made from home.

Replying to Major Shallard (American Bee Journal, 1918, Page 370), I agree with him fully in his desire to sell honey with flavor and aroma unimpaired. Like him, I do not care for the idea of running the honey straight from the extractor to the selling packages. There is so much variation in the honey taken from different supers in the same apiary at the same time that we prefer to blend it in large quantities, as stated.

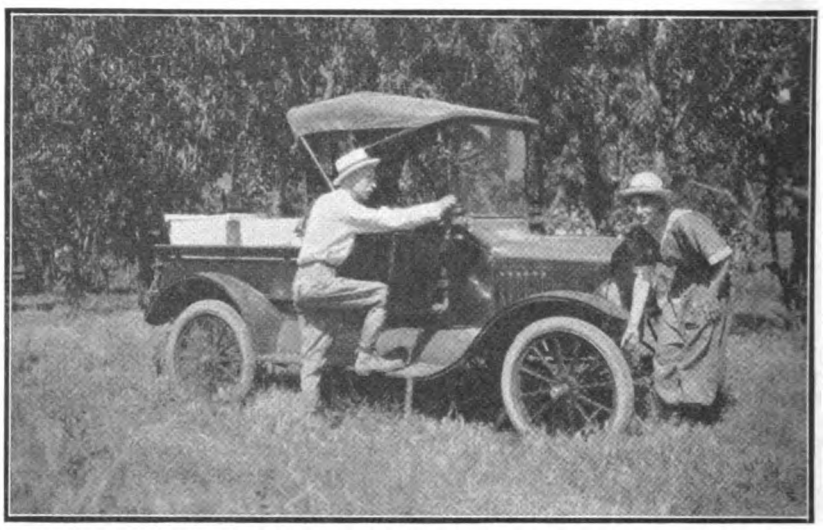
I believe Major Shallard's difficulty with capping melters is that he tries to render wax and honey from cappings at the same time. He is not alone in this, but I consider it cannot be done without too much flavoring of the honey. The melter should not liquefy the wax sufficiently to make

it form a solid cake, much less flow from one spout of a separator while honey flows from the other. The second point is to get the honey away from the heated wax as quickly as possible, and the third point is to blend that honey with the extracted honey while it is hot. By itself it is undoubtedly changed in flavor. Blended it, if anything, improves the flavor of the whole.

In the matter of straining, I am with the Major, heart and soul. After much experimenting, I have no use for attempting to strain honey through any material which would be effective as it comes from the extractor.

Georgetown, Ontario.

Editor's Note—See Mr. Pettit's article "Apiary Buildings and Equipment," page 152, May 1918 issue of this journal.



Mr. and Mrs. C. D. Stuart, authors of the series of articles on "My Neighbor's Garden," published in this journal.

The Wisdom of the Bee

By D. W. Macdonald

THE marvelous, if mysterious, wisdom which guides and governs the actions of a colony of bees is concentrated in the workers who, individually and collectively, control the destinies of the community. In their wise heads lies the government of this vast and complex republic. The queen, important and, indeed, indispensable as she is, has no share in the making or carrying out of the laws. Legislatively or administratively her voice is silent. The drone exists only for the continuance of the race, for the "propagation of his sweet kind." The brain of the one true female is atrophied in order that her ovaries may have full development. The brain of the male is made subservient to the special organs on which so much of the future welfare of the race depends. All the powers of guidance, government, management, combat, control, foresight, prudence and prescience are bound up in the tiny brain of the worker-bee. She, in fact, is the spirit of the hive. In our ignorance, we say that instinct guides her every action through the busy seasons of spring, summer, and perhaps autumn, and this teaches her to gather food, to store it up in the combs, to set out on a trek when she finds the population outgrowing the accommodation, to make provision for replacing a failing queen and to carry out the countless duties thrown on her. Something guides her actions when preparing against winter's cold and the period of semi-inaction. In no other way is the wisdom of the bee more markedly displayed than in the almost prophetic manner in which she stores the supplies of both heat-giving and flesh-forming food. The first is placed just where the bees of the cluster most require it during a long siege from cold, and the system of storing provides against its deterioration. Then the pollen is so placed that it does not come under the bees' observation readily until spring's approach demands its presence and its use as soon as active breeding starts. In preparations for winter and during that season of semi-repose the hive-bee manifests its wisdom in countless ways, and very rarely, indeed, does she ever fall into error or wrong-doing. During early winter she is content to live a life of semi-hibernation, well aware that the precincts of the domestic hearth is the only place for perfect contentment and unalloyed happiness. Each member of the community acts as if she lived not for her own selfish aims and objects, but for the well-being and safety of the commonwealth. "Each will for the good of the whole is bent." Each unit of the thousands, in a spirit of forethought and prescience, takes a part in keeping up the temperature to a living degree.

On this question of hive temperature depends successful wintering, and in controlling it the workers display marvelous anticipatory wisdom. As the cold increases, the bees in their oval ball gradually contract the bulk of the cluster, clinging more closely together; but they do not depend on this mutual attachment alone for keeping up warmth. Honey is a heat-producing food and the bees presciently have stored a reserve supply in their honey-sacs ready to be drawn upon when necessity calls for its use. As the cold strengthens they draw upon these stores, and, as it were, stoke their fires, thus ingeniously getting up and keeping up the heat of the winter cluster. Presciently again, they still further provide for contingencies. The individual bees are ever in a state of flux, and thus while the cluster remains intact the component parts are regularly alternating. Gradually but steadily those outside become the inside section and the outside crust becomes the central core. The matter does not even rest there, for these bees have been in contact with winter stores and they transport full honey-sacs to feed both themselves and their neighbors. Wonderful forethought! For thus the temperature of the hive is regulated at the will of this Amazonian host.

Study this cluster at a later period during the winter or early spring and our admiration of their fore-knowledge must be even more marked. After weeks, or it may be months, of close confinement when, owing to the heavy drain on it, food has become scant. Suddenly a mild day comes; the bees are privileged to have a cleansing flight, but they do not waste the shining hour in idle frolic or wanton dance outside. They daringly search the hitherto unworked combs of the hive, uncap the stored cells and transfer the life-giving nectar to the combs on which they rearrange the cluster, ready now to stand another siege from cold. Their wisdom teaches them to re-store these brood-frames in anticipation of need. Here is forethought of a high order. Their foreknowledge teaches them that vastly increased stores will be consumed when active breeding sets in shortly.

Soon after the turn of the day the "Spirit of the Hive" whispers to the community that another season has begun to dawn, and the workers offer the Mother a wonderful concentrated food which some instinct has taught them to manufacture in their wonderful laboratory for the very purpose. That stimulation begets eggs in the ovaries of the mother-bee, and thus breeding begins in the center of the cluster where the temperature is highest. This, too, is wisdom, for there only can the egg, the larva and the pupa obtain care and that degree of heat which is necessary to evolve the future perfect imago.

If a breakdown occurs in a hive it is at once rectified by the bees. There is no leaving off until a future occasion with the bees, no putting off until the morrow. Whenever a crisis arises the wrong is righted.

Place bees into an empty hive, or insert an empty frame in an established stock and immediately wonderful wisdom is displayed by the workers. A section of them starts active operations, glut themselves with honey, set their laboratories to work and manufacture wax. Look at their "pockets" some time after,

and you find eight wax plates, one in each, and every one evolved from a liquid inside and now transferred to the outside of their bodies. The romance of the hive lies in what they do with these plates of wax. The bee transfers each of these forward to the mouth, and there masticate them, make them pliable, cut them into shape, and in some marvelous way beyond our ken they are constructed into the hexagonal cell, thousands of which are required to complete a comb.

Two points may be given showing the wisdom of the bee connected with her stinging propensity. When the flesh is stung the bee generally does not try to pull out the apparatus directly, aware that it may at the same time lose some of its inner organs. It circles on its sting as a pivot, all the time slackening the hold of the barbs, so that in the end it withdraws the weapon freely. Again, even when in a fury, there is method in its madness. Provided as the sting is with palpi or feelers, these sensitive organs test the quality of the substance about to be attacked, and if impervious the feelers telegraph to the brain to say that an attack would be labor lost.

Banff, Scotland.

BEE-KEEPING FOR WOMEN

Conducted by Miss Emma M. Wilson, Marengo, Ill.

Eight-Frame Hives for Winter

In this department, in spite of the waning fortunes of the eight-frame hive, a word has been said in its defense, when used by women, on account of its lightness and greater ease in handling. At the same time it was freely admitted as its greatest fault that the smallness of the hive made it more difficult to avoid starving in winter. Now comes no less an authority than Miss Iona Fowls, of the staff of Gleanings, and says there is not only more danger of bees starving in 10-frame hives than in 8-frame, but also more danger of their freezing.

In Gleanings, December, 1818, page 743, she says: "Although we prefer the 10-frame hive and could name several good reasons for this preference, wintering would not be among them. We believe there is not only more danger of the colony on 10-frames starving, but also more danger of their freezing. During very cold winters we have known medium colonies on 10-frames to starve with plenty of stores at the side of the hives, the bees having evidently been too cold to reach the honey. Had the hive space been smaller it would have been much easier to keep up the temperature, and less stores would have been needed. In the case of the 8-frame hive, or the 10-frame contracted to 8-frame, the colony may be left with the necessary clustering-space, and still have 35 or more pounds of honey. Good colonies, if suitably packed, will winter on even seven frames, which we have repeatedly proved with hundreds of colonies."

If now, Dr. Miller and others can be converted to Miss Fowls' views, the poor 8-frame hive may be allowed a respite before it is doomed to utter extinction.

(It is very apparent that Iona Fowls has never been a bee inspector with an opportunity to see how the average small beekeeper neglects them, else she would never say that **More** bees starve or freeze in 10-frame hives than in 8's. Her observation is very evidently confined to well-kept apiaries where an abundance of stores have been provided. The average small beekeeper never looks into the brood-nest, but is content simply to put on supers in spring and to remove them with contents in the fall. To find bees short of stores in 8-frame hives is so common as almost to seem the rule. In the larger hive there is more room in the brood-chamber and consequently the removal of the supers does not remove so large a portion of the stores. The writer has often known cases where farmers have lost nearly all their bees from this cause when with larger hives they would have left sufficient stores to carry the bees over. It is an unfortunate fact that we find the 8-frame hive most often in the hands of persons who are poorest equipped to use it. The 8-frame hive is an expert's hive and should never be used by one who is not prepared to give bees expert attention. In the hands of indifferent persons the larger the hive the better.

I feel safe in saying that 75 per cent of the annual loss of bees among the farmers of the northern states is from removing too much honey. Since 90 per cent of these people never look into the brood-nest, they depend upon the bees to provide for themselves in the lower story. Few people who have bees are beekeepers in the proper sense of the term. —F. C. P.)

In Gleanings for December, 1918, Editor Root is quite enthusiastic over the idea of big hives. No, he is not advocating 10-frame hives, but out-Dadants the Dadants by advocating, at least for fruit growers, 13-frame hives! His enthusiasm, which is more or less of the contagious kind, is evidently the result of a visit of two or three days with Adams & Myers, of Ransomville, N. Y., who, beside operating a 70-acre orchard, run 300 13-frame colonies of bees. And the strange thing in the case is that these 13-frame hives are said to be handier to lift than 8-frame hives!

Says Mr. Root: "I said to Mr. Myers, 'I do not see how you lift those great 13-frame hives.' 'They are a great deal handier,' he replied, 'in my opinion, than 8-frame hives of an equivalent capacity tiered away above my head. I can lift a heavy load along about the height of my chest or waist, when half of that load might be considerable of a strain if it were above my head.' I watched these men at work. It was evident that by their management they do not 'break their backs' any more than beekeepers with hives of 8 and 10-frame capacity. The secret of it is that the individual unit, while heavier, can be lifted to better advantage because it is never above the chest line."

It is plain that while the 13-frame hive is five-eighths heavier than the 8-frame hive, when you come to pile extracting supers on each, in order to have piles of the same capacity, the 8-frame pile must be five-eighths higher than the 13-frame pile. To be more definite, if 13-frame hives are piled 5 stories high it will make a pile of 65 frames, and if we put these into a pile of 8-frame hives it will be 8 stories high, with one frame left over. Now lift the top story off each pile. It is not hard to believe that it is easier to lift the one from the lower pile, even though it be five-eighths heavier than the one on the other pile, since the top one on the one pile is hardly more than breast high, while the other is almost out of reach.

With this view of the case, would it not be the part of wisdom for us women folks who want to avoid heavy lifting to adopt the 13-frame? But before deciding it may be well to look into the matter a little more fully. For other stories than the top stories are to be considered. Suppose we have lifted off two of the larger stories and three of the smaller ones, leaving the piles of nearly the same capacity. The advantage is now all on the side of the smaller hive. Decidedly so; for not only do the larger supers have a little disadvantage in height, but the disadvantage of being five-eighths heavier. So when the whole pile is lifted down, there doesn't seem to be much difference, does there?

Now if those of us who are using 8-frame hives have all of them piled 8 stories high every year, all season, in other words give every colony 56 extracting-combs, and no other consideration is involved, it might be worth while to consider changing to 13-frame hives. But in such apiaries is it not the general case that for every pile 8 stories high there are three to ten or more that are not more than 5 stories high?

Another thing to be considered: There are times when the hive containing the brood-combs is to be lifted from one stand to another. It may be, too, that it must be carried into the cellar and out again. In these cases the lifting is 62½ per cent harder with the large hives than with the small ones. So, taking all in all, if the larger hives are preferred, it will hardly be because they lessen labor.

At this point one may imagine a bright little woman arising to remark, "So far as I am concerned it is idle to discuss the matter. I simply haven't the strength to lift a 13-frame story, and I can lift an 8-frame one. If there is need to pile more than 5 stories high, I can extract enough to make room; or, I can use a step-ladder or a box."

DR. MILLER'S ANSWERS

Send Questions either to the office of the American Bee Journal or direct to DR. C. C. MILLER, MARENGO, ILL.
He does NOT answer bee-keeping questions by mail.

Transferring—Restless Bees

1. I bought several hives of bees in old, worn-out hives. The bottoms are nailed and the frames so tight they cannot be taken out. I want to move them in new hives; can I do that by turning them upside down on top of new hives with full sheets of foundation when there is a good honey flow in June, and will the queen and bees go down into the new hive next fall?

2. My bees are in the cellar and all hives are quiet but one. This one is v ry restless and throws off a strong odor. It weighs 45 pounds, so surely has enough stores. They had a heavy run on buckwheat the last half of August, when it suddenly turned cool and wet. Can it be that the honey was not ripened enough, and soured? Would they behave that way if the queen died? But this would not account for the odor. I have put sugar candy on the bars, but it don't seem to help. SOUTH DAKOTA.

ANSWERS.—1. Yes, unless the season is a failure you may expect things to turn out about as you have anticipated. But if the bees are left entirely to themselves after the new hive is placed under the old one, you may find in the fall that the brood-nest is partly below. If the season should prove very good it may be that the two stories will not furnish room enough. So it will be well for you to examine occasionally, and as soon as you find the queen is laying in the new hive you should put a queen excluder between the two stories. In 4 or 5 days look to see if there are eggs below, and if not you must take away the excluder for 2 or 3 days, when you can return it if you find eggs below. In three weeks after you have succeeded in getting the queen shut off below, all the worker-brood above will have emerged, when you can extract the honey from above, or you can leave it till fall. Of course you will give more room for surplus if it is needed. (Would it not work better to place the new hive above, instead of below?.—Ed.)

2. You don't say what kind of odor. If very disagreeable, it may be foulbrood. If not, queenlessness may be the trouble. It is just possible that the trouble may be neither one of these, for it sometimes happens that one colony in the cellar may be especially uneasy when there appears no good reason for it, unless it be pure cussedness.

Large Hives—White Clover

1. Which hive would you prefer, the 10-frame story and a half or a 13-frame hive all Hoffman hives except the half story, increase to be made by dividing, and all run for extracted honey?

2. Does a cross between golden and 3-banded Italian ees make them cross like crossing with black bees?

3 There was some white clover around here last season, but the bees didn't work on it much; do you suppose there was any seed in the blossoms enough to seed it for next year, 1919? We had some good rains in October and lots of rain in November. I never knew anyone to sow white clover seed; does it lay over from one season to another when it is real dry? IOWA.

ANSWERS.—1. I'd like to be accommodating enough to answer your question, but the fact is, I don't know. Maybe some one at Hamilton does.

(This will be treated separately.—Editor.)

2. I think not.

3. Most likely you will find a fair supply of seed has matured. Yes, the seed will lie over, if dry enough, till another year.

Increase—Cover Picture

1. How would it be for increase in spring to give another brood-chamber and feed, if necessary, and just before the flow opens move to a new stand and place top chamber on old stand, seeing that there are eggs in the queenless colony?

2. Do bees breed in cellar in the early spring?

3. How much honey will my round tank hold, 5 ft. wide, 5 ft. deep, pounds or gallons.

4. Who are the lady and children on front cover of October number?

ONTARIO.

ANSWERS.—1. It will do all right, but it will be a good while before a queen is reared.

2. Often.

3. About 734 gallons; 8,800 pounds of honey.

4: Mrs. Hillman and children, of Seattle, Wash. It's a very beautiful picture.

Non-Swarming Hive

1. Is there not a demand for a non-swarming hive?

2. Could we not, by hive construction, accomplish a great deal to prevent swarming? MISSOURI.

ANSWERS.—1. Yes; at least there would be if such a hive were made.

2. I don't know. A good deal of effort has been made in that direction; yet it is a question with what success.

The Sheppard Plan Again

The article beginning in the center column of page 412, December, 1918, issue of the American Bee Journal is of peculiar interest to me, and would like to have your opinion on one feature of it. It is stated therein that when there are two full-depth hive-bodies upon each other with an excluder between and the queen above with but little brood, the bees will make queen-cells below. The question is, what do you think of this as a probability?

Now, in center column, page 27, January, this year, "Mass." writes of thinking to do the same thing, except that instead of an excluder between the two hive-bodies, he speaks of a "3-inch double hole in center of cover over the lower hive," and as to that in view of the above first referred to, you revert him back to the original Demaree plan.

While I was putting up my comb supers with bait and starter sections for use this coming summer (they are now all ready) I had hastily taken off and temporarily put out of the way these supers from their hives, and on overhauling them found honey that I sold for $8. In one of these supers there was a lot of dead bees right in the cells; as one is apt to find or see in brood-frames, there was also honey in some of these cells; besides that there was much staining, suggestive of dysentery. My question is, would you mind putting sections and baits so derived on hives with colonies, or had I better destroy them? Of course there was nothing in the way of brood in these sections; just fully matured dead bees and quite a profusion of dysentery, spattering. I feel satisfied that the bees died after the supers were taken off. PENNSYLVANIA.

ANSWER.—If a common zinc excluder be used, it is likely cells will be started below. If the new wire-excluder be used, it is much less likely. Indeed, you would get that idea from Sheppard's article were it not for what I am sure is a printer's error. The types make him say, "when the new excluder was used the bees, as a rule, would build queen-cells." I am sure Mr. Sheppard meant they would *not* build queen-cells. So, if the wire excluder be used you must do as Mr. Sheppard suggests, put both an excluder and an extracting-super between the two stories with brood. You might also accomplish the same thing by putting a sheet under or over the excluder, the sheet being small enough so that a margin of an inch or more should be left on all sides for the bees to pass up and down.

If you will look again you will see that the plan of "Massachusetts" differs widely from that of Mr. Sheppard. In the one case the bees are entirely separated, no bees passing from one story to another; in the other case there is free passage for all workers, although not for the queen. In the one case half the brood is with the queen, leaving the probability of a swarm from that half, while in the other case the queen has only one brood. In the one case there is no killing of queen-cells, while in the other case all cells but one are killed in the queenless part. Don't you think the two plans are about a mile apart?

The fact that I "revert him back to the original Demaree plan" is nothing derogatory to the Sheppard plan. I am safe in referring to the older plan, because I know more about it and it has been more fully proven. I suspect the Sheppard plan is an improvement, but I don't know. It is possible that in the hands of others it may not prove so successful. And in giving advice to one with so raw a plan as that of "Massachusetts" it is better for me to play safe and advise plans well proven.

It is not advisable to use the sections containing honey nor the dysentery-bespattered ones. Those merely containing dead bees may be used, and it is possible you may help the bees to clean them out if the dead bees are thoroughly dried. Shake out what bees you can by pounding the sections flat on a table.

Brood-Combs Above Sections

In American Bee Journal, 1918, page 276, "Swarm Prevention, as managed by Fowls," may work very well for extracted honey, but how for comb?

Don't you think the bees would use some wax from upper brood-combs to cap sections? MISSOURI.

ANSWER.—Yes, my experience has been that when brood-combs were above sections the bees would cap the sections with more or less dark comb, no doubt brought down from above. The sections will also be darkened if brood-combs are close beside them. The bees will even carry up some dark comb from below to work into the cappings of sections if the sections are close down to the brood-combs; so it is worth while, when working for section honey, to have thick top-bars in brood-frames, if for no other reason than to keep the sections white.

Sheppard's Plan Discussed

1. Referring to W. J. Sheppard's article, page 412 of December, on experiments with variation of Demaree plan when by two or three frames of brood with the queen are placed in another brood-body over the colony with an excluder between, leaving its bees to build cells in the brood-body and rear a young queen, wouldn't it be well to give them a ripe cell at the time of changing the queen?

2. How would it work to place the queen and all the brood but two frames above, leaving two frames of sealed brood and a ripe cell from a choice queen in the body below, placing another body with empty combs or frames of foundation, between the body con-

taining the queen and the one with the queen-cell (instead of the excluder)?

3. Would the cell hatch and the young queen be laying eggs before the two queens got together?

4. Wouldn't the young one be apt to overcome the old one when they did meet?

5. Will bees smother in the winter if the entrance becomes clogged with snow and ice when they have a deep super on top packed with forest leaves, but no ventilation?

ILLINOIS.

ANSWERS.— 1. It might be well, and it might not. With young brood of all ages below, the bees might start other cells, and then swarm as soon as the young queen was ready to go. It would be entirely feasible for you, instead of killing all cells but one to kill *all* cells, and then give a cell of best stock.

2. That would be merely taking away from the story with the queen two frames of brood, and generally that would not stop swarming.

3. I should expect the virgin to go up into the story containing the queen before it was time for her wedding flight.

4. Considering that the old queen is cumbered with eggs and the virgin more agile. one might expect the younger to come off first best, but experience has shown that when the laying queen is satisfactory she will continuc in power, either because she gets the better of the virgin, or because the workers take a hand in the matter. If the queen be such that the bees desire to supersede her, the case may be different.

5. If, as you say, there is *no* ventilation above, then the bees should smother when snow and ice close the entrance. If the packing above is sufficiently open to admit enough air, then there should be no smothering.

Shed for Bees

I have built a shed in which I expect to keep all of my bees. I have built it 24 feet long, 8 feet wide and 4 feet high. I can put about 13 hives in a row and I can make 3 rows, which is about the width of my shed. I would like to know whether it would be all right to put the hives in front of each other; if so, would there be any danger of the bees from the last row flying into the hives of those in the first row. I have made doors by which I can close the front of my shed when the snow comes. Do you think my plans are all right? ILLINOIS.

ANSWER.—It is hard to be sure about anything with bees until it is tried, but I'm afraid your plan will not be very satisfactory. With the three rows in the shed the bees inside would not have a very good chance for light and heat from the sun when a flying day comes, and there would likely also be some mixing of the bees of different hives.

How Large an Apiary?

1. I have 80 colonies in my home apiary and have bought 70 stands more. I intend to hold my final number to 200, and have within a radius of two miles each way about 800 acres of alfalfa and some sweet clover. Do you think I could secure the maximum amount of honey by having these bees all in one apiary? (centrally located.)

2. How wide do you make the slats on your rack under bees? NEW MEXICO.

ANSWER..—1. I confess ignorance in such a case, but would guess yes.

2. About half an inch; but it might vary.

Foulbrood—Requeening

1. My bees had foulbrood last summer and I caged the queens in the hives that were the worst (The ones I did not cage only had a little foulbrood.) I sent and got a dozen Italian queens and requeened only about one-half of what colonies I have, last September. How is the best way for me to requeen the rest of my colonies next spring from the pure Italians I have?

2. I have a queen coming to me; what is the earliest time I could have her come next spring, from Alabama? IOWA.

ANSWER.—1. You cannot do it next spring very well, for you can hardly rear queens successfully in Iowa before about June. One way will be to let the colony go to near the close of the harvest with its old queen, then make it queenless, kill all queen-cells a week later, and give it a sealed cell of your best stock. That would not materially interfere with the harvest.

2. So far as your end of the line is concerned, it ought to be safe to receive the queen any time in May, and possibly in April, provided a queen is ready to be sent at that time.

How Far Can the Bee See—Observations, Etc.

1. How far do you suppose a bee can see an object—tree, water course or a house—when coming in from a distance of a mile or two loaded?

2. If I should look into brood-chamber now would I find any eggs at all or any young bees in cells?

3. When does the queen quit laying?

4. I've made an observation hive (1-frame) and aim to take out a frame from one of my colonies at the proper time and put in my observation hive and let the bees raise a queen. Later on, can I take that frame out. brush off all bees and put a frame of full sheet foundation in observation hive for bees and queen to work on and put the frame of young bees in another colony? Would that cause trouble in the colony? I am a novice.

5. At the proper time next spring I aim to buy a queen and 3 pounds of bees to put in a 10-frame hive full sheet comb. When they arrive will bees and queen all be together, or will queen be in a cage?

6. How had I better proceed to get them in the 10-frame hive?

7. Will 3 pounds of bees put in 10-frame hive early build up a full hive by next fall, or had I better buy 4 pounds?

8. I suppose I had better buy here in Texas or Louisiana, so I can get bees in a few days. How long can bees be in transit and do well?

9. About what time should I get my queen and bees I am to buy?

10. How far north do bees live?

11. My observation hive will be in my south colony, in the shade. Will a dark cloth or brown paper over it be sufficient to keep out the light?

12. I have 4 8-frame hives native bees and will buy one Italian queen and a few pounds Italian bees. The queen I buy will continue to raise Italian queens and bees, but will her daughters stand 4 chances to 1 to be impregnated by my native drones, and vice versa?

13. If I don't exhaust your patience I will write again later on—maybe. TEXAS.

ANSWERS.—1. I don't know; but I have an idea it can see as far as a man, or further; so it might see a house or a big tree two miles away.

2. You would probably find neither eggs nor brood.

3. As far north as I live the queen stops laying in September or October, and maybe in November. I don't know, but I should think it might be a month later in Texas.

4. You propose to brush off all bees and put the frame of young bees in another colony; by which I suppose you mean the young bees yet in their cells. No trouble would come from putting these in any colony.

5. Like enough the queen will be caged. Depends on breeds from whom you buy.

6. One way is to put a brood-comb from another colony in the hive, set the package in the hive beside it with opening close to the comb; cover up and let the bees take their time to occupy the comb or combs in the hive. Possibly instructions may come with the package.

7. In a good season they should not only build up, but yield surplus.

8. They might stand a week; but of course the shorter the confinement the better.

9. As early as the seller is ready to send them.

10 I don't know, but have an impression that I have read of their being about as far north as human habitations are found.

11. Dark cloth or paper will probably be sufficient.

12. You can increase the chances of pure mating by keeping all drone-brood out of dark colonies, but your neighbors' bees are to be reckoned with. It may take several years to work out all black stock.

13. I have a good stock of patience on hand, so don't be afraid to come again. But it would help a whole lot if all would take pains to write very plainly. A good way is to try the questions on someone else before sending. If they can read them, I ought to be able to make them out.

Drones in Winter

The bees were flying this 11th of January and one of my hives has drones in it. Now I have been told that if the bees have drones in the hive in the winter that they are queenless. What I wish to know is what is best to do with that stand of bees. They are a very strong swarm. INDIANA.

ANSWER.—Nothing can be done until bees are flying in April or May. Then see if there is any worker-brood, for there is a bare possibility that they are all right in spite of a few drones. If you find no worker-brood, you can unite it with a weak colony that has a good queen, or you can give it a queen that you will have sent by mail.

Swarm Control

1. I run my bees for extracted honey and cannot be with them every day. How can I get the greatest possible amount of honey per colony without any increase and still make sure of having no swarms? Would it be best to shake them at the proper time, giving all but one brood to another hive, or would the colony store more surplus by leaving brood and putting queen below an excluder? If the latter course was followed wouldn't there still be danger of my losing some swarms?

The honeyflow here is from white clover, only lasting from June 15 to July 15 or 20, with no fall flow.

2. If a colony be shaken after it has capped queen-cells and left with one brood and no queen-cells, would they still want to swarm, or would they do good super work?

ILLINOIS.

ANSWERS.—1. You can hardly do any better than what you propose, and you will likely get more surplus from the colony by leaving the brood and putting queen below excluder. Of course, you must kill cells if there be any at time of putting brood above excluder. and also about 8 or 10 days later.

2. In such a case you would be quite safe in counting upon excellent super work, with no thought of swarming.

Bees Smothered

1. I have several hives in which the bees were smothered out the winter of 1917-18, full of comb and candied honey; also full of moths and their webs. Would like to ask through the Journal what to do with them.

2. I would like to requeen; which would you advise, the golden or 3-banded Italians?

3. Would it not be best to get northern-raised queen. I see they raise more of them in the southern states. IDAHO.

ANSWERS.—1. As the moths have had a pretty good chance at them, there is likely nothing better you can do than to melt up the whole business, saving the wax and either feeding the honey or making it into vinegar. If any of the combs, however, are not in too bad condition, you can put them in the upper story of a strong colony to be cleaned up, or you might give them to a colony that is building up.

2. Some prefer goldens, but probably more beekeepers like the 3-banded better. Our own preference is for 3-banded Italian stock.

3. The southern raised queens apparently give as good satisfaction as northern raised ones.

Increase—Yellow Jackets

1. I am away from home and have to do all of my work on Sundays. I have 4 swarms of bees and 11 10-frame hives and 45 frames of extracting combs. I lose all of the young

swarms and I wish to divide them. I have plenty of medium brood. I can't send for queens, as I would not be home to care for them. I wish increase, honey is secondary. The main honeyflow commences July 1. Now, with the equipment that I have, please give me the best way for increase.

2. Yellow jackets trouble my bees very much, commencing in mid-summer and keeping it up until late fall. The bees apparently can't handle them. I have the golden Italian. The yellow jackets robbed my neighbors' bees and killed 7 swarms. I wish to learn some way to help the bees to handle them.

WASHINGTON.

ANSWERS.—1. It is hard to advise without knowing something about your experience and ability. If you have not done so, the first thing is to get a good text-book on beekeeping, such as Dadant's Langstroth, and study up the whole subject of beekeeping. Then, if you want some work that gives additional information about artificial increase, I know of nothing fuller than my book, "Fifty Years Among the Bees." I might suggest one way that may suit you: Put into an upper story all brood but one, leaving in the lower story the one brood and queen, filling vacancies with empty combs or frames with full sheets of foundation. Put an excluder over the lower story, an extracting-super over that, and then the story of brood. A week later you should find sealed cells above, when you can divide the brood into two, three or more parts and start that many new colonies, of course having at least one good queen-cell in each one.

2. I'm afraid I can't help you much. But you can keep your colonies strong, and destroy all yellow jackets' nests you can find.

Disinfecting—Goldens—Moving

1. Will painting the inside of a hive with gasoline disinfect it from American foulbrood?

2. Can one with ordinary skill and intelligence in apiculture successfully combat American foulbrood?

3. Which is the best, golden Italians or the leather-colored; or is there any difference?

4. Will moving bees as late as December 15 cause the queens to start egg-laying?

CALIFORNIA.

ANSWERS.—1. No; but good authorities believe it unnecessary to disinfect anything but the combs, and the only thing to do with them is to melt them up.

2. Yes. If you are uncertain about the case send sample to Dr. E. F. Phillips, Department of Agriculture, Washington, D. C., and he will tell you what the disease is, and give instructions for treatment, with no cost to you.

3. Probably the majority prefer the leather-colored.

4. Probably not; but if it should it would likely continue only a few days.

(I recently visited a California apiary moved about that date and found nearly all queens were laying.—F. C. P.)

Carbon Disulfide Will Not Kill Eggs

I notice on page 27 that Dr. Miller says: "If you fumigate with carbon disulfide no second fumigation will be needed, as eggs and all will be killed."

Texas Bulletin No. 158, which I think is an authority on bee moths, page 29, says: "In **all the experiments,** the eggs of the bee moth were **uninjured** by the fumes of carbon disulfide."

One-fourth ounce per cubic foot, or an ounce for three standard large supers (10-frame) for 12 hours was recommended for worms. The moths were killed in 20 minutes. Every beekeeper ought to have Texas Bulletin No. 158 (June, 1913).

The eggs hatch in from 10 to 12 days, when a second fumigation will be necessary.

C. E. FOWLER,
Hammonton, N. J.

Raw Sugar for Feed

This has been a very favorable winter in this Southern Ontario district for outside wintering of bees. My bees had a splendid flight as late as the 18th of December, and up to that time the weather was warm enough every few days for them to come out—and the bees took full advantage of the opportunity.

Acting upon the suggestion of the Department of Apiculture at Guelph, I fed six colonies with syrup made from raw sugar crystals. The syrup was very dark in color and most unappetizing to look upon, and I fed it with misgivings; but being unable to get the requisite quantity of granulated, I used that sugar instead of frames of honey. I have noticed one peculiar thing about the bees in those six colonies—they appeared to be much livelier than any others of the forty-five colonies in my apiary. At the first sign of higher temperature those bees were out and flying, while the others would remain inside. If it happened to be very warm (and we had quite a number of unusually warm days in the fore part of December) the bees fed upon the raw sugar syrup were very lively, indeed, so much so that it was quite noticeable. As most of the bee literature relating to fall feeding states particularly "be sure and use nothing" but the best of granulated sugar," I shall be greatly interested in the fate of those six colonies.

E. V. TILLSON,
Ontario.

(There is little doubt that the activity of the bees fed this syrup was caused because they were uncomfortable. Whenever an inferior grade of honey is stored for winter, the bees are always more or less active, even in cold weather, if confined for long. If the bees do not have frequent flights they suffer seriously.—Ed.)

About Goldens

A California reader wants a discussion of the Goldens. He says that if there is a strain of goldens as good as the leather-colored Italians he wants them, for they are beautiful.

There is an old saying "Handsome is that handsome does," which applies to bees as well as other things. We cannot afford to sacrifice production for beauty, but if the Goldens will hold their own with the others when it comes to counting up the returns after the crop is sold, then beauty is an added attraction. We invite letters from our readers who have given them an extensive trial.

Chenango County Beekeepers Meet

On December 14 the Chenango County Beekeepers' Society held its first annual meeting in the County Court House at Norwich. The meeting was well attended by a large number of enthusiastic beekeepers from Chenango and adjacent counties in New York State.

The meeting was called to order promptly by appropriate remarks by the Chairman, T. R. Gorton. The program committee had prepared a very interesting and instructive program consisting of addresses by prominent beekeepers. The addresses by George H. Rea, of the Department of Agriculture, Washington, D. C., on "Organization and Its Benefits to Beekeepers," and "Modern Beekeeping, the Cycle of the Year Including Wintering," were presented in Mr. Rea's easy, free manner.

Charles Stewart, of Johnstown, N. Y., gave an address on "Foulbrood and Its Control," which was very timely, as European foulbrood is causing heavy losses in the County. He dwelt on the importance of young Italians of a good resistant strain in the control of European foulbrood and securing a maximum crop of honey.

The address by E. P. Smith, "Observations in Reference to Beekeeping in the County," brought out the fact that only a small proportion of the available nectar from the flowers was gathered.

With the discussions of the addresses brought out and the question box, it was a very busy day.

The society decided to have an exhibit at the County Fair and to hold a field day during the summer. They also affiliated with the State Association and the Farm Bureau.

The officers for the coming year are O. W. Bedell, Earlville, President; C. G. Brown, South Otselio, Vice President; T. R. Gorton, Norwich, Secretary and Treasurer.

Remedy for Propolis Skin Poisoning

Mr. O. A. Hostetter, of Yreka, Cal., sends us the following remedy, which he takes from the "Scientific American Cyclopedia of Receipts," and which he says is good both for the skin itching from propolis and for poisonous ivy:

"Dust aristol on the parts affected. Do not apply with the fingers, as it would at once melt. It gives instant relief and one-quarter ounce cures any case of skin poison."

Aristol is thymol iodide, and is recommended for skin affections. Its properties are similar to those of iodoform. It is also used in an ointment. It is very high in price now, $2 per ounce, but it certainly would take less than a quarter ounce to procure relief.

Arkansas to the Front

Arkansas has been overlooked in the matter of beekeeping up to the present time, but the people are awakening up to the realization of the fact that we have an ideal bee country. We have very few wide-awake beekeepers. Most of the beekeepers are of the old type, "Gums" and "Swarms" and "Robbing the Bees," and can remember the time when "Grandpa cut down a tree and got two or three tubs full of honey," etc. But we have some men who are right up to the minute, and the climate is ideal.

On January 3 a meeting of the beekeepers was called at Fort Smith by Mr. J. V. Ormond, Special Field Agent, Bureau of Entomology, and Mr. C. M. Tuggle, County Farm Demonstrator of Sebastian County. We were all surprised at the attendance, as the weather was bad and the call was short, but we perfected an organization with the following officers: Mr. H. P. Gunnaway, President; J. L. Kelly, Vice President; C. J. Cline, Secretary-Treasurer. There were present many visitors from the adjoining counties and all present were very enthusiastic and went away with the determination to get their county organized as soon as possible.

We hope to help organize Crawford County early in February, and Franklin County later.

This immediate community gathered a fair crop of honey, considering the condition the bees wintered over, as few beekeepers pack their bees in winter.

J. W. PRICE,
Fort Smith, Ark.

Yellow Sweet Clover

It seems to me that the honey made from the second crop of yellow sweet clover is best. We usually cut it for hay after it has been three weeks in bloom. In one weeks' time the ground is again covered with a yellow carpet. It blooms from the ground up and continues until the frost kills it. If one can't see the bees on that bloom he can hear them, and if barefooted he can feel them. There are undoubtedly plants which furnish more honey for a few days, but for a long period there is nothing like it.

J. D. KAUFMAN,
Kalispel, Mont.

Hamlin Miller Passes On

Hamlin B. Miller, of Marshalltown, Ia., for several years secretary of the Iowa Beekeepers' Association and vice president of the National, is dead. Mr. Miller was an enthusiastic beekeeper and will be missed at the Iowa conventions. He was present at the first convention, when the association was organized, and has never missed one since. With the exception of possibly one year he has held office in the organization since the beginning. He was a member of the first board of directors, later secretary for several years and vice president at the time of his death. Beekeeping was a side line with Mr. Miller, to which he devoted himself largely on account of his health. His friends have known that he was afflicted with diabetes for several years, but few were prepared for the announcement of his death. Mr. Miller was still in the prime of life, being only 57 years old at the time of his death.

Paste for Labels on Tin

In the February number is an enquiry for a paste that will stick labels on tin. This recipe I have had this past summer and have found it to be a success, provided that it is used liberally, not wastefully:

Dissolve in a little cold water (soft preferred) 2 heaping teaspoonfuls of corn starch, in another vessel dissolve three-fourths of a teaspoonful of Lewis lye in nearly pint of water and pour into the corn starch, It is now ready for use. For larger quantities use the same proportion. I was like "Michigan," could not get labels to stick, till I ran across this recipe; have had no further trouble since; gave it to two of my friends and they have had no trouble, so will give it to the general public.

FRED TYLER,
San Jose, Ill.

Honey From Corn

I see you ask about bees working on corn, or Indian maize. Many years ago, after my bees had secured the early crop, I knew they had been at work on corn. I extracted the honey and found it what I thought rather poor quality. I know they secured this from the corn tassel, as I saw them at work on it in great numbers. I secured four 5-gallon cans of this honey and set it aside, thinking I could use it to feed back to the bees in the spring. Along in the winter I tasted it and found it very fair honey, and then sold it out and had no complaint from it. It was of a light amber color and had a very good flavor after it had set awhile.

I also once secured some smartweed honey, and when first taken it had the smartweed taste, that is, it would bite like the taste of smartweed. I set it aside for awhile, when it got to be of a very good taste, and one, after trying it, came back and bought a 5-gallon can of it; I have never secured either of the above mentioned honeys pure since, but it would be mixed with other sources. In the cases mentioned I secured it pure, as stated.

J. W. ROUSE, Mexico, Mo.

The Metal Honeycomb

Last spring I secured ten aluminum honeycombs and gave them a good trial, both in the brood-chamber and as extracting-combs. I have written of the frailty of the cells, and found that I was not mistaken, for in uncapping, the dragging of wax particles over the edges of the cells bent the metal, while a bit of hard propolis damaged twenty or more cell edges.

This will, I believe, spoil them for use in the brood-chamber; but there is another feature which does not look good to me, and that is that it seems to be impossible to remove the old larval skins from the cells. I washed a frame in boiling water and dried it, and found that the skins were not removed, and I think that it would not be long before the frames would have to be replaced, the same as with wax combs.

I am not at all prejudiced against the metal comb; on the contrary, it looked good to me, and I may draw wrong conclusions; but I write that others may save work and study, or, if they wish, repeat my experiments.

A. F. BONNEY,
Buck Grove, Ia.

Mild Winter

We are having very mild weather here; most too mild, I fear, for so early. Bees have been flying and carrying some water for several days and I fear a cold spell coming now would cause considerable loss.

C. E. SHELDON,
Coeur d' Alene, Idaho.

Early Spring in Texas

On January 28, at noon hour, the sun shines warm. It is amusing to see my bees chasing house flies and green or bottle flies, away from the entrance. I wonder what these flies are trying so hard to get into the hive for. Quite a number of bees are carrying in pollen. Where can they get pollen at this season? I was surprised to see so many bees carrying in beebread.

M. S. PARRISH,
Milan, Texas.

A Good Location

Eleven thousand six hundred dollars from less than 600 colonies of bees is not so bad for a young man only 64 years old. I purchased 600 new hives, power extracting outfit and Peterson capping melter. The capping melter is too slow, and I set it aside the second day.

My automobile comes handy to pull loads of honey away from the beeyard before hitching on the mule team or pulling loads of bees in or out of the apiary, where there are 600 colonies of bees flying. I keep mine all together in one yard, in a mesquite location, and a thousand seem to do as well as a hundred would do.

J. M. HERMAN,
Chandler, Ariz.

Monroe County, New York, Organized

The beekeepers of Monroe County, New York, organized an association at Rochester on February 1, with 41 members. F. M. Pillsbury is the secretary.

It Pays to Advertise

In the People's Home Journal for December, 1918, is a paragraph in a story written by Anna Brownell Dunaway, which reads as follows:

"'Honey,' offered Hiram, shortly.

"'Oh, yes,' laughed Mr. Posey, 'that's it—honey. Eat Bonney Honey. Alfred Bonney, King Bee,' is the way the advertisement reads. But being as he's retired, I suppose he's what you might call a drone now.'"

The above quotation indicates that

Bonney's advertising has been read and now is being passed on. Now is the time for other beemen to be thinking about advertising before the bottom drops out of the price of honey.

Nectar From Corn

Last fall, while passing through a field near my apiary, the owner jokingly called to me that my bees were "eating his corn."

This corn had been planted too late and did not get ripe. The leaves had turned yellow, but the stalks and ears were more or less green and full of juice. The owner was gathering a small quantity for his hogs, and I found from two to five or six bees sucking the sweetish juice from the end of the cobs, where these had been broken from the stalks.

Would it not seem probable, therefore, that the bees could also gather this juice through the medium of aphids on the stalk or leaves, whether they secure honey from this plant in another manner or not?

A. G. VAN RONZELEN,
St. Louis, Mo.

Honey From Corn

One summer my bees were starving; no flowers or nectar anywhere. One morning the bees went roaring as though they were swarming. As they all went east, I followed to see what caused the excitement. As I climbed over the fence into the cornfield the bees were just roaring all over it like they do in basswood trees in bloom. I went over the field and watched them for a long time. They were working on the tassel and not on the silk. They were not gathering any pollen nor carrying any in the hives. All the honey I got that season was from the cornfields. I got about 20 pounds per colony for the season, and that was the only time I ever got pure corn honey. It was of the constituency and color of basswood, but was of a peculiar flavor. Nothing else was mixed with it.

Since then I have seen them gathering nectar a few times, but only spasmodically, and not amounting to anything.

They also gather pollen from corn every season. I never saw them working on the silks.

The corn tassels do not secrete nectar every year. The weather conditions must be just right for the bees to get anything at all.

Now as to aphides; I have seen thousands of them; but my honey was not aphide secretion, but the pure nectar, with a flavor not forgotten if once learned.

SYLVESTER KALER,
Arkansas City, Ark.

Another Pioneer Beekeeper Gone

M. M. Baldridge, the oldest subscriber of the American Bee Journal, died at his home at St. Charles, Ill., January 31. He was a reader of the Journal since its first issue. Mr. Baldridge was 81 years old. His face was a familiar figure at the Chicago bee conventions.

Montana Beekeepers to Meet

As we go to press we get the announcement of an interesting program of the Montana beekeepers, who will meet at Billings on March 11 and 12. The meeting will be held in the Parmly Billings Public Library.

Ashes on the Snow

For several years we have been overcoming the snow handicap by spreading fine dry ashes over the snow at the first indication that it will be warm enough to begin melting the snow, and also considering the bees will have a flight.

If the bees should come out before the snow is melted very much the ashes darken the snow, taking the glare off, thereby eliminating snow-blindness among the bees and loss of bees from alighting in the snow in front of the hives.

We sack up our ashes in the fall when they are dry and find that three or four sacks, if dry, are sufficient for a yard of 100 to 150 colonies.

We begin spreading the ashes on the windward side of the yard and find that it spreads best by a throwing motion, using considerable force.

R. L. PENNELL,
Ignacio, Colo.

Confining Queens During Honeyflow

I am going to put a question up to you which is causing me a good deal of worry in anticipation.

You know that here in Minnesota our honeyflow is from white clover and basswood, which comes practically in one continuous rush. Now, when this rush is over, there is nothing more doing, as far as surplus honey is concerned, so it behooves us to conserve this flow in every way possible.

One way is to confine or remove the queen at the beginning of the honeyflow while the bees are raising a young queen. This not only prevents the use of this flow for brood-feeding, but also prevents the production of such a swarm of useless bees after the season is over.

Again. I wish to put the brood in such relation to the hive that I shall not be obliged to look into any division but the top for queen-cells when, in ten days, they must be disposed of.

After the change is made the hive will be arranged: first division (the main hive) with empty drawn combs; second division, empty drawn combs; third division, all of the brood except as specified in question three.

Now for the questions:

DR. L. D. LEONARD.

First. Will the bees work just as well in the two divisions below the brood if the queen is removed from the hive at the time the brood is put above?

Answer. I believe they will, for they will not be hopelessly queenless.

Second. Will the bees work better if the queen is confined in a small cage just inside the entrance, no brood being present below the top division?

Answer. I do not think it will make much, if any difference from No. 1.

Third. Will a blanket made of queen-excluding zinc holding two frames of brood placed in the first division (hivebody) wherein the queen may be confined, be enough better than either one or the other alternatives to warrant the expense in making?

Answer. It may, but I hardly think so. Try 3 or 4.

Fourth. If in ten days I remove queen and place a frame of brood with a queen-cell from the top division to the bottom, destroying or removing all other cells in the hive will the bees be likely to swarm when the young queen is hatched and goes out on her mating flight?

Answer. This depends entirely upon the crop conditions. If they are good, I believe the bees may swarm.

These questions we do not have to answer in our localities of spring and summer flows. So the replies can only be tentative.

Why not confine the queens in a cage for only 8 or 9 days; then open the hive, release her and destroy the queen-cells, if she does not do it herself? I can see no objection to so short a confinement. But in a period of 8 days, if the crop is good and the bees bringing plenty of honey, most of the breeding cells that are emptied of their brood by the hatching of young bees, will have been filled with honey. With the 8 days or 9 days of non-laying and the shortening of the brood space thereby caused, the production of brood might be delayed sufficiently to secure the result wanted, a less number of bees to feed during late summer. We must make sure that the colony is not sufficiently weakened or endanger its chances to winter safely. A week or more of delay would, in my mind, be quite sufficient.

Great foresight must be exercised not to remove the queen too soon, as some of the force needed would be lost. Of course, if the queen is old or of poor value, it is best to remove her entirely. Let us hear the experience of others.—C. P. D.

Value of Good Stock

Mr. E. G. Carr, State Apiarist of New Jersey, tells of a beekeeper who four years ago was on the point of giving up beekeeping because of European foulbrood. He was induced to try selected Italian stock, with the result that this year he produced 400 pounds of extracted honey from one colony, and it was not regarded as a favorable season, either. The presence of European foulbrood often stimulates beekeepers to give more careful attention to their bees than ever before. Its presence makes the introduction of good stock imperative. Many good beekeepers date their success from the time when they began to fight this disease, so perhaps, on the whole, the benefit derived from overcoming it has more than balanced the injury it has caused to the industry. It has served to call attention to value of the best stock in a striking manner.

AMERICAN BEE JOURNAL

VOL. LIX—NO. 4 HAMILTON, ILL., APRIL, 1919 MONTHLY, $1.00 A YEAR

THE BEE-FLOWERS OF NORTH AMERICA

BY JOHN H. LOVELL

Note. There are thousands of bee-flowers which are not honey-plants, and many honey-plants are not bee-flowers, although the bees get honey from them. This article endeavors to make clear the importance of bees to flowers. Bee-flowers are flowers which are adapted to bees rather than to other insects. When the author says that the blackberry is not a bee-flower, he means that this plant is not dependent upon bees, so long as other insects are abundant.—Ed.

IN the diverse, yet inseparably united relations of nature, bees play three very important roles, as honey-makers, flower-makers and fruit makers. As makers of honey the habits and industry of the honey-bee have excited wonder and admiration for many years, but it is only recently that their services in the production of fruit have been appreciated. Modern fruit culture is dependent on bees. Many cultivated fruits are self-sterile, and all appear to yield better when cross-pollinated. Every fruit plantation should have its apiary. The service rendered by bees (both social and solitary) to this country annually in the pollination of fruits and vegetables, buckwheat, fodder plants and many flowers certainly exceeds in value $100,000,000, in its widest sense, indeed, it is beyond price.

There is not a person living who comprehends what our flora would be like, if there had been no bees. They have been the unconscious builders of thousands of bright-colored, attractive blossoms. Alone among insects they feed their brood on pollen, and to store in their cells a sufficient quantity of it requires countless visits to the bloom of plants throughout the entire season. It was a momentous epoch in the world's history when the ancestors of the bees became flower visitors. These primitive insects were wasp-like in appearance, with smooth bodies and

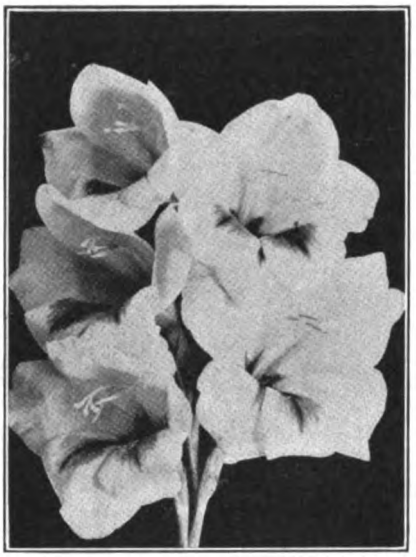


Fig. 1.—Gladiolus. A bumblebee flower

short tongues. They tunneled in the ground, as is still the habit of most solitary bees; and, when they began to provision their nests with balls of pollen instead of dead insects, the foundation was laid for the prosperity of the future race of bees, and indirectly for a powerful influence on mankind.

While bees have been a more important factor in the development of the majority of conspicuous flowers in our flora than any other group of insects, the effect of their visits is most evident in bee-flowers. A bee-flower has the nectar concealed and is, or was, chiefly pollinated by bees, as white and red clover, the mountain laurel and the larkspur.

Many of them are valuable honey-plants; and, in showing us the ways in which bees have modified flowers in the past, they should teach us some useful lessons in regard to the possibilities of the future.

A list of North American bee-flowers shows that they are very widely and unevenly distributed in the different plant families. A great family, as the pea, mint, or figwort family, may consist almost entirely of bee-flowers, while there may be none, or only a few, in other large families. There are no flowers adapted to bees in the pink, mustard or carrot families, and they are likewise absent from that immense group, the Compositæ, which contains the asters, goldenrods and thistles. The inflorescence of this family represents Nature's greatest triumph in flower building, and is well worthy of the careful consideration of both beekeeper and botanist. No other family contains so many honey-plants. The individual flower is of little significance, and conspicuousness is gained by massing many of them in a head, an arrangement which permits insects to visit them very rapidly. Intercrossing, economy of time and material, a large number of seeds and their wide distribution have all been perfectly attained. In this the most successful of plant families there is a large and varied company of visitors to the flowers and little modification of the corolla, just the opposite of conditions in the orchis family, to which we shall refer a little later.

In order to obtain a clear understanding of bee-flowers it is necessary to consider more in detail a few of the common species. Let us begin with the lily family, which contains so many familiar field and garden flowers, among which are the bee-flowers, Solomon's seal, the twisted stalk, grape hyacinth, lily-of-the-valley, asparagus and squills. The green tubular flowers of Solomon's seal are pendulous and adapted to bumblebees. The deep blue flowers of the grape hyacinth *(Muscari)* are urn-shaped, hang downward, and bees gather the nectar from the oblong clusters, which resemble bunches

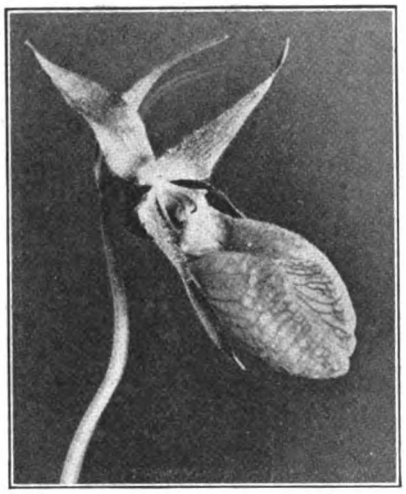


Fig. 2.—Lady's slipper. A small bee-flower

of small grapes. Bees visit the little bells of the lily-of-the-valley for pollen only. Asparagus is a good honey-plant and the inverted green flowers yield nectar freely; it is extensively cultivated in America and grows wild so abundantly on the Russian steppes that the cattle feed upon it like grass. The lilies are chiefly pollinated by butterflies. In the lily family the bee-flowers differ from the other forms chiefly in their pendulous position and longer and partly closed corolla.

But in the orchis family we meet with a number of bumblebee flowers, as the snowy orchis *Pogonia* and *Arethusa*, which are brilliantly colored and very irregular in form. This is a family of marvels, with an endless variety of bizarre forms, in some instances mimicking bees, flies and birds; one species *(Catasetum)*, produces three flowers so unlike that when they were first brought to Europe they were described as belonging to three different genera. Imagine, then, the consternation of the botanical species-maker when Sir Ralph Schomburgh declared that he had seen all three flowers growing on one plant. A typical orchis flower consists of 15 organs, but usually they are so modified and united that only 7 or 8 can be discovered. Unlike the Compositae, the individual flower is very highly specialized, the nectar is deeply concealed (an orchid from Madagascar has a nectary ten inches long), and visitors are few both in kind and number. Many of the flowers fail to set seed, sometimes not one in a thousand, and much of the seed proves sterile. The species are rare and do not succeed well in competition with hardy plants. The orchis family is far less successful than the Compositae, and we are forced to conclude that elaborate modification and adaptation to a few insects is apt to prove a disadvantage. Of the 5,000 species none of them are good honey-plants, and only one, the vanilla bean, is of economic importance.

The lady's slipper *(Cypripedium acaule)* is a ground-bee or Andrenid flower. Small bees of the genus Andrena enter the slipper between the two front elastic folds, which immediately close again after it. The trapped bees make their escape through one of the two small holes at the base of the flower, coming first in contact with the stigma and then rubbing from the anther pollen which is carried to the next flower visited. (Fig. 2.)

In the American Bee Journal for August, 1917, brief descriptions were given of the columbine, monkshood and bee-larkspur, bumblebee-flowers frequently cultivated in gardens. Other peculiar shaped bee-flowers are the Dutchman's breeches *(Dicentra)*, bleeding heart, climbing fumitory, the pale *Corydalis*, the jewelweed, and the blue violet. The object of these odd forms, so far as they are not an incidental result, is to compel the bee to pursue a fixed path to the nectar, so that pollination may be effected with greater certainty, e. g., in the

Fig. 3.—Wild bean. A bee-flower growing in damp thickets

violet the bee is compelled to come in contact first with the stigma and then with the pollen, since it must run its tongue through the cone of anthers in the center of the flower in order to obtain the nectar. Many bee-flowers are so dependent on the visits of the bees that in their absence they fail to produce seed, as red and white clover, *Salvia* and larkspur.

A very remarkable bee-flower from Europe, the seed of which may be obtained from any florist, is the fennel-flower, or ragged lady, or, as it is sometimes called from its finely dissected foliage, love-in-the-mist *(Nigella damascena)*. The eight petals are transformed into nectaries, and in each one there is a little bowl or cavity covered with an elastic lid. Bees are the only insects clever enough to lift this lid and suck the nectar, and when they go away it again falls into place. Clearly in the absence of bees this flower would never have been evolved, and clearly, too, bees are the most skillful of all flower-visitors.

Bee-flowers are almost entirely absent from the rose family, but there is one that well deserves our gratitude—the raspberry. The blackberries, the plums, the cherries, the thornbushes, are not bee-flowers, but the raspberry is a true bee-flower, although it is also visited by other insects. The flowers are inverted, and the petals stand erect, crowding the stamens against the cone of pistils in the center; the nectar is secreted by a ring between them. Bees can cling to the under side of the flower and reach the partially concealed nectar better than other insects. Perhaps the reason the blackberry yields much less nectar than the raspberry is because it is not a bee-flower.

The various steps by which a tubular bee-flower may be evolved are well illustrated by the currants and gooseberries, shrubs familiar to every farmer. The petals are small and scale-like, and it is the sepals which are chiefly employed in shutting out other insects. The common red currant has greenish nearly flat flowers, the broad sepals open widely and the nectar can be readily gathered by many insects. But in the European gooseberry *(Ribes Grossularia)* the blossoms are little hanging bells with the entrance narrowed and partly closed by a fringe of hairs. Flies cannot obtain much of the nectar. The black currant *(R. nigrum)* has still deeper bells. Honeybees not only gather nectar from the flowers, but also in their haste open the buds. Slightly different stages are shown by many other species; but in the golden currant *(R. aureum)* the calyx is cylindrical, nearly half an inch long and the only visitors are bees. The bright golden flowers change with age to a deep red, a color change which easily distinguishes the older flowers which have been pollinated and have ceased to secrete nectar. Nature often speaks in enigmas, but at times she is a very patient teacher, revealing her methods step by step, if we will only take the trouble to observe them. But mankind is too often typified by the man

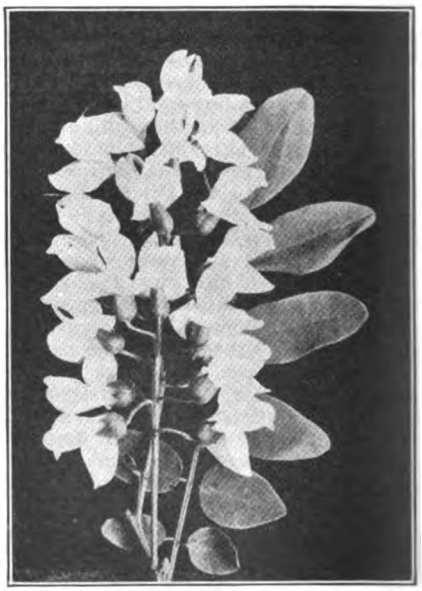


Fig. 4.—Black locust. A bee-flower

in the house of the Interpreter, who, with eyes cast down, raked to himself sticks and straws, and would not look up and behold the one who offered him a celestial crown.

The pea family, or Papilionaceae (Gray makes this family a sub-family of the pulse family or Leguminosae), consists almost wholly of bee-flowers, of which there are some 5,000 Among them are many excellent honey-plants, as the clovers, alfalfas, sweet clovers, vetches, false indigo, sainfoin and locust. The butterfly-shaped form is well shown by the sweet peas, with its broad, showy standard, wing petals and keel enclosing the stamens and pistil. Both the individual flowers and the flower-clusters are highly attractive and conspicuous; the clovers and vetches brighten large areas with their bloom, and in Texas the blue lupine carpets the ground for miles with its blue blossoms. Of the 197 species in the northern states, 39 are white, 33 yellow, 13 red, 88 blue-purple, and 24 blue. The predominance of blue and blue-purple flowers is noteworthy. When more than two species occur in a genus it is seldom monochromatic, it usually contains flowers of more than one color; of the clovers, 4 are white, 3 yellow, 4 red and 3 red-purple; of the tick-trefoils, 2 are white, 1 red and 19 blue-purple. The flower fidelity of a bee is greatly helped by these differences in color. (Fig. 3.)

This great family of bee-flowers is in so many ways unique among plant families that we are reluctant to leave it. Why, when bee-flowers are wholly absent or few in number in so many families, does there occur this vast assemblage of them in a natural group? This is not a matter of chance. The teleologist of a century ago would have told us that they were made so, and thus have dodged the question and closed the door of investigation. Today we seek for actual causes. The abundance of these plants is partly due to their great vegetative vigor, which is partially explained by their strong root system and to the presence of nitrogen-fixing bacteria on the roots. Another cause is the great vitality of the seeds which are longer lived than those of any other plant family; certain legume seeds retain their viability after 150 to 250 years. Everyone knows that beans will germinate after years in storage. Fig. 4.

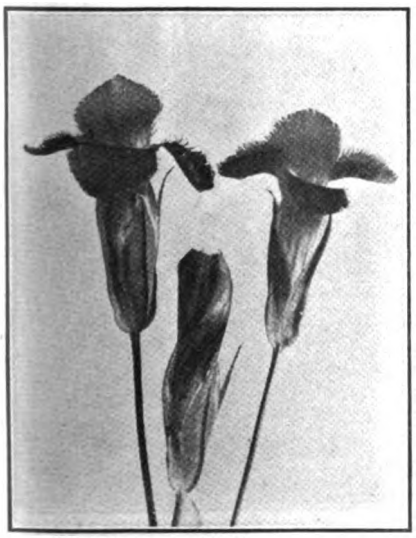


Fig. 5.—Fringed Gentian. A bumblebee flower

The flowers of this family at some time in the remote past were regular in form, as they still are at times in the common laburnum; but the butterfly-shaped corolla was very early developed and was handed down to the various genera as they successively appeared. Many species are very efficiently pollinated by bees; but others are not, and many flowers show slight imperfections, as though Nature, like Jove, had nodded at times in the never-ending work of creation. The normal flowers of the wild peanut are generally barren, lucerne secretes nectar longer than is needful, bees puncture some species and rob others through crevices,

Fig. 6—Bee-balm. A bee-flower of the mint family

while the garden pea is wholly self-fertilized. I know of but one bee in the northern states able to depress the keel of the sweet pea, and that is the large leaf-cutting bee *(Megachile latimanus)*. There can be no doubt that many of the species would be better off if they received, like the Compositae, a greater variety of visitors.

In the heath and blueberry families there is another great group of bee-flowers; but unlike the members of the pea family they are all shrubs or small trees. (Fig. 10.) The Rododendrons and Azaleas are handsome bumblebee flowers, but the rotate blossoms of the mountain laurel invite bees of all kinds. Other familiar genera are the checkerberry, fetterbush, *Andromeda*, trailing arbutus, sourwood, leather-leaf, bearberry, and heather, several of which are indispensable to bee culture. The flowers are small, white or pink, urn-shaped, often pendulous, and the pollen is sprinkled over the bees from pores in the ends of the anthers.

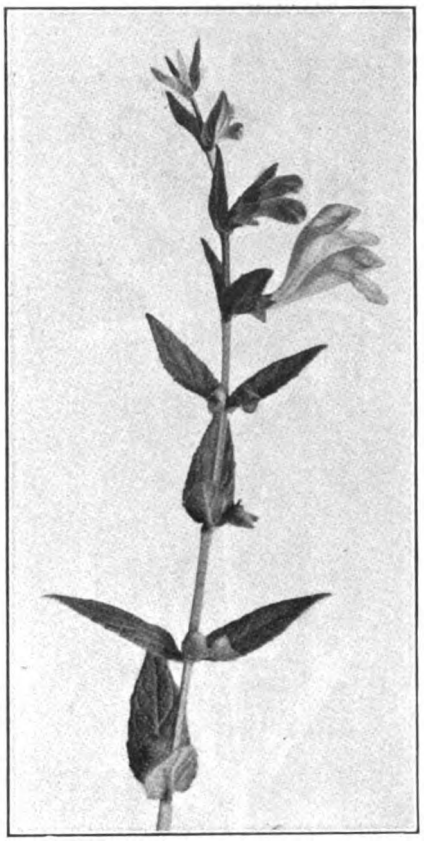


Fig. 7.—Skullcap. A two-lipped bee-flower of the mint family. The long corolla tube points to bumblebees as the most important pollinators

Sour-wood, in the Appalachian region, is one of three leading honey-plants.

The heathers or heaths are not indigenous to America, although three species occur locally in eastern New England; but in northern and western Europe heather or ling *(Calluna vulgaris)* covers vast areas of waste or sterile lands called moors. When it grows a yard tall, the fine evergreen leaves, the purple stems, and profusion of pink flowers present an expanse of color long to be remembered. Its uses among the peasants are numberless, being employed for brooms, brushes, baskets, fuel, brewing, roofing, beds, dyeing and fodder. Another beautiful heath, the purple heath *(Erica cinerea)* is also common on the lower moors of Great Britain. Both secrete nectar plentifully and furnish a generous surplus of amber-colored honey, with an aromatic flavor, but so viscous that it is difficult to extract. In southwestern Africa the heaths reach their maximum and the 500 species are a prominent element in the vegetation of that region, reaching the height of 12 feet and being covered with white or pink blossoms for a large part of the year.

Blue bumblebee flowers among the gentians delight the traveler in the Alps with their vivid masses of blue coloring, and the blue bellflowers are also partly bumblebee flowers. (Fig. 5). Another blue bee-flower is borage, which has become so common wild in Australia that it is listed as

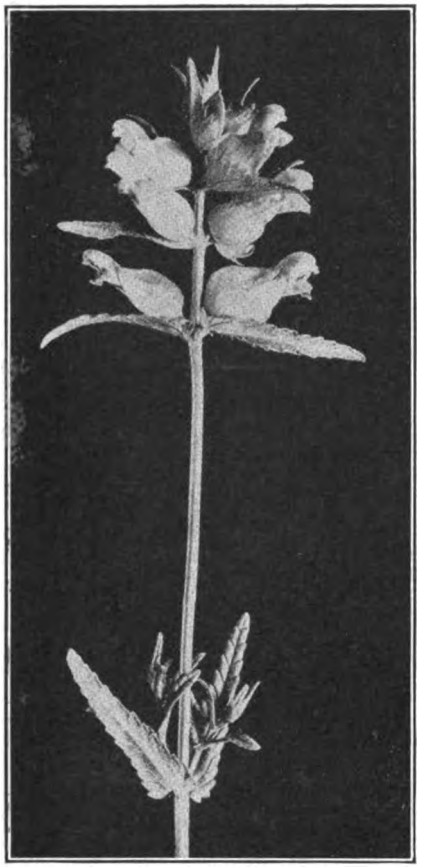


Fig. 8.—Yellow rattle. A bee-flower of the figwort family

a honey-plant. The flowers of the borage family are often at first red and later change to blue, and several species are filled with coloring material. In the sheep pastures of New Mexico there grows blood purslane *(Plagiobothrys arizonicus)*; "when the sheep find a patch of it, it colors their heads red clear to the ears."

In the mint family *(Labiatae)* and figwort family *(Scrophulariaceae)* there are many bee-flowers, which stand nearly horizontal and are mostly 2-lipped. According to the way the lips have developed the larger flowers exhibit strange fantastic forms, which mimic the heads of reptiles, animals, or inanimate objects; such are the turtlehead, snapdragon, monkey-flower, toadflax, foxglove, skullcap, shoe-flower, painted cup and dragon-head. The species in both families number nearly 5,000, and are chiefly herbaceous. Among the more important honey-plants in the mint family are the sages, catnip, hoarhound, pennyroyal and motherwort; but in the figwort family honey-plants are rare, perhaps the best known being the figwort. Neither family promises to be of much benefit to the beekeeper, except locally. (Figs. 6, 7 and 8.)

Regular flowers, it will be noticed, stand vertical, that is, they either face the sky or the earth; while irregular flowers always stand more or less horizontal. In the dense flower-cluster of the horse-chestnut the lateral flowers are irregular, and the single terminal flower is perfectly regular. A vertical flower is approached by insects from all sides with equal ease, and the forces which might tend to change its form are in equilibrium, or counterbalance each other, as in the buttercup and strawberry; but when a flower stands horizontal, like the snapdragon or sage, bees nearly always alight on the lower side of the corolla. The lower petals become transformed into a lip, which serves as a landing stage; and the upper petals are modified into a helmet to protect the anthers from rain. A bilabiate flower, is, after all, not such a great marvel. (Fig. 9.)

So long as a flower is flat like a plate, it attracts a varied company of insects; but as soon as it becomes bilateral many insects either cannot find the nectar or are unable to reach it, with the inevitable result that the visitors are restricted chiefly to bees. None but bees can learn from observation to find the nectar of fennel-flower. No bees but bumblebees have tongues long enough to reach the nectar of the bee larkspur, and none

Fig. 9.—Two varieties of the monkey flower. A bumblebee flower. Note the horizonntal position of blossoms.

but bumblebees are strong enough to push their way into flowers like snapdragon.

The bee-flowers of Europe are essentially the same as those of North America and belong to the same genera and families, but the species are often different. In the German and Swiss flora there are 482 bee-flowers. of which 152 are white and yellow, and 330 red, violet and blue. Honeybees and bumblebees have been observed to make 20 per cent more visits to the red and blue flowers than to the white and yellow. East of the Rocky Mountains and north of Tennessee there are 366 red and red-purple flowers, and 519 blue and blue-purple flowers; and a large per cent of them are bee-flowers. Why are so many bee-flowers red and blue, especially blue? There is no reason to suppose that blue coloration gives bees an aesthetic pleasure, but on the other hand I have shown experimentally that they can readily distinguish blue from other hues. So keen an observer as the honeybee might easily learn to associate blue with flowers likely to supply it with nectar. In primitive genera in which the corolla has been little modified blue is almost entirely absent, as in the yellow buttercups, fivefingers and St. John's-worts; and in the white water-plantains and saxifrages, and the yellow and white mustards. While there are exceptions, it is certain that blue coloration is correlated in some way with the high specialization of the corolla. Whatever the origin of floral colors there is no doubt but what they are an advantage, and that in the absence of insects, especially bees, they would never have been evolved.

Bees have been the most important agents in the development not only of bee-flowers, but of most conspicuous blossoms. We cannot imagine what the world would have been without them, or estimate the enjoyment that would have been lost, or the power for good that would have been forever missing; but we know that humanity would have been less perfect than it is today. They have been the humble, unconscious instruments in producing results that enter into the very foundations of modern civilization.

Intensive Beekeeping

By F. W. Sladen, Apiarist, Dominion Experimental Farms.

IN a locality where colonies are ready to swarm a month before the principal honey-flow begins, an increased number of bees can be raised for honey production by wintering two queens in the hive.

This conclusion has resulted from investigations the writer has been making into conditions at Ottawa,

Fig. 10.—Black huckleberry. A bee-flower with bell-shaped corolla

Canada, where a honey-flow from dandelion causes swarming at the end of May in colonies that have wintered well, and the honey-flow from clover does not begin until the end of June. It is simply the guiding principle of spring management, the raising of a maximum number of bees in time for the principal honey-flow, pressed, under specially favorable conditions, to a stage beyond what is possible by following the accepted rules of management.

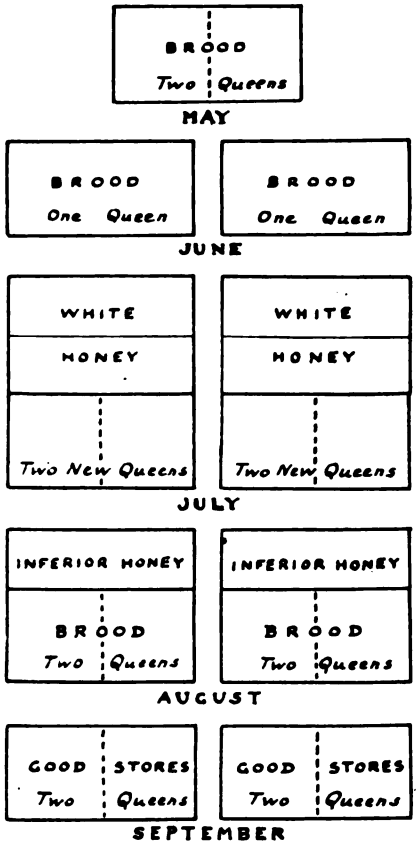
With only one queen in the hive, should early swarming take place, there is the serious interruption in breeding caused by the swarming and the time taken for the old queen to get into full laying again and the young queen to get mated and attain full laying. Should swarming be prevented, the queen soon reaches the limit of fecundity, and before long the number of bees produced daily ceases to increase.

On the other hand, with two queens in the hive, separated by a double wire cloth division, if one of these with her bees is removed to an adjacent empty hive a few days before the swarming season begins, there will be a steadily accelerating production of young bees, provided it is not checked by a honey dearth, a condition that can be remedied by slow feeding.

From a hive of bees containing two queens wintered at Ottawa in 1917-18, that covered 5½ combs on April 25, 480 pounds of honey were produced, while an average of only 223 pounds each was produced in two colonies of equal strength then, that contained only one queen. However, as only one and two colonies were compared, and as one-half of the bees that produced the large return were fed during a part of the honey dearth in June, and the other half consisted of hybrids, these figures cannot be regarded as conclusive. Yet there is every indication that the gain will be great. A satisfactory feature of wintering two queens in a hive and putting one of them with half the bees into another hive during the dandelion flow, is that some of the chief troubles of spring management are thus avoided. Early swarming is prevented, and the inferior dandelion honey is turned into bees.

These considerations have formed the starting point of a system which was evolved and tested last summer, for getting the two queens established in the hive and also for the prevention of swarming without much labor, which is one of the great problems in northern apiaries. This system, which consists essentially in removing the old queen from the brood-chamber during the early part of the main honey-flow, while two others are raised and mated there, the wire-cloth screen being again inserted and a special portico placed in front of the hive to prevent the young queens from meeting or entering one another's sides after the mating flights, has brought other advantages in its train: the annual requeening, the raising of a greater number of young bees in August for wintering than in a colony having only one queen; and last but not least, the removal from the brood-chamber by the bees, to make room for this brood, of a great deal of honey, more or less unwholesome for wintering, so that its place can be filled with a wholesome mixture of sugar syrup and clover honey fed to the bees as soon as breeding has ceased. A colony wintered well on this mixture is 1917-18. In the writer's opinion, unwholesome stores is one of the greatest and most difficult-to-remedy causes of winter loss in many parts of Canada.

This system is so different from the ordinary methods of beekeeping that it cannot be recommended, unless after extensive trial it proves successful. All that can be said at present is that, after a small and necessarily somewhat imperfect trial, it has proved to be workable and looks promising.



Sladen's experimental plan with two queens in one hive

During the clover honey-flow in 1918, thirteen colonies had their queens removed from the brood-chamber and eight days later all queen-cells were cut out except two, one on each side of the double wire-cloth division then inserted, or two special cells were substituted. In six of these colonies fertile queens and worker brood were found on both sides of the division in early August and in six more on one side only. No swarming took place, although nearly all the other colonies in the apiary repeatedly built cells in preparation for swarming.

It was decided that a good way to make good the failures, was to introduce with her brood in early August, when the white honey was removed and the super for dark honey was placed on the hive, a selected old queen, which, after her removal from the brood-chamber at the commencement of the honey-flow, had been caged for eight days in the super, and had then been placed in a weak nucleus specially made for her, with one of the combs containing a little brood and a few bees from her colony.

Heretofore the only successful method of swarm prevention at Ottawa has been the finding and cutting out of all queen-cells, entailing the lifting off and on of supers, frequently heavy with honey, every week, sometimes oftener, during the nine weeks the swarming season lasts, which is a great labor. If the above method of preventing swarming, which requires only two or three easy manipulations, proves to be a success on a large scale, as it has already done on a small one, its adoption will be justified, even though, under some conditions, it may inhibit slightly the production of honey, because it leaves the beekeeper free to manage a much larger number of colonies, and it forms a part of a system, several features of which are calculated to considerably increase honey production.

The system constitutes a good control measure for European foulbrood, and the annual requeening will eliminate losses from old and worn-out queens that figure high in many apiaries.

Details of the experiments with this system were given in the "Canadian Horticulturist and Beekeeper" for October, 1918. Ottawa, Ont.

Honey From Tobacco

Located as we are, in the heart of the Florida shaded tobacco section, we have had some little experience with tobacco as a honey plant. Twice in five years we have had a flow from that source. First in 1915 and another, and heavier, the past season. Growers usually cut tobacco stalks immediately after harvesting the crop, and for that reason we have had only the two flows, and are unable to say how long or heavy they would be if stalks were left standing. Harvesting tobacco is usually over by the middle of July, and because of the scarcity of labor the past season stalks were left standing for a week or ten days longer than usual, and during this time we got a surplus.

The honey is of heavy body, in fact very heavy and dark, almost like "Blackstrap" molasses. It has never granulated with us, though it might in a cooler climate.

I cannot describe the flavor, but you tupelo and clover producers need not be alarmed. We do not claim it to be better—nor do we expect to take your "fancy trade" with it. A mixture of "Star Navy" and "Brown's Mule" chewing tobacco will give you some idea of the flavor.

J. T. DE LACY, Havana, Fla.

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language. Consolidated with The National Bee Journal in 1874.

Published monthly at Hamilton, Illinois.

Entered as second-class matter at the postoffice at Hamilton, Illinois.

SUBSCRIPTION RATES—In the United States and Mexico, $1 per year; three years, $2.50; five years, $4. Canadian postage 16 cents, and other foreign countries 36 cents extra, per year.

All subscriptions are stopped at expiration. Date of expiration is printed on wrapper label.

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THE EDITOR'S VIEWPOINT

Cost of Honey From Package Bees

The Iowa College of Agriculture is conducting some interesting experiments in apiculture, under Prof. Wallace Parks. The past season careful weights were made to ascertain the cost of wintering over colonies and the surplus secured was compared to that secured from package bees from the South. One, two and three-pound packages were used in the experiment. The costs of honey secured are interesting and while a single season does not give any very satisfactory data it is clear that unless better results can be shown in favor of the packages, that it will not pay to destroy our bees in the fall of the year and depend upon replacing them from the south the following spring. Under this experiment the costs per pound of honey stored was as follows:

1-pound package	$ .28
2-pound package	.13—
3-pound package	.13+
Wintered colonies	.08

The difference in cost between the two and three-pound package is so slight as to be surprising, and this in the face of a poor season. It would be expected that the difference would favor the larger package, especially in a poor year. We understand that the experiment will be continued, and results will be watched with interest. The one-pound package is too small for immediate results, and little more than the establishment of a colony can be expected from a single pound of bees, unless it be an exceptional season.

Honey Plants

We are publishing in this issue some interesting letters concerning the climbing milkweed or shoestring vine. This plant is of limited distribution and is not generally known, yet it is a very important honey plant in the region where it grows. W. L. Wiley, of Brunswick, Mo., writes that it furnished most of the surplus in that locality last year and that strong colonies stored 100 pounds or more from this source.

There are dozens of good plants which are not widely distributed and consequently little known. We will be very glad if our readers will cooperate with us in making a survey of the honey plants of the entire country. Whenever the bees are found to be working freely on a plant which is not generally discussed, we will appreciate samples of the plant, together with the blossoms and full notes concerning the amount and kind of honey secured, time of blooming and any other interesting information. We have been at work for the past three years on a volume of the honey plants and such information will be of great help to us. It is only through the co-operation of the beekeepers of the whole country that we can hope to make the volume complete enough to be of real value. Much has been written about alfalfa, sweet clover, basswood, the sages and a few others of great importance, but we are anxious to get information on the plants which are important in a few localities and which are seldom heard of elsewhere.

In our last issue, and again in this, are several letters about the corn plant which serve to throw some light on the question as to whether bees get honey from corn. Although our success depends upon the honey-plants of our immediate locality, less is known about the problems of nectar secretion than any other phase of beekeeping. We feel that matter of this kind should be of much interest and value to our readers.

Shallow Brood-frames

In the discussion of the proper size for brood-chambers that will accommodate the most prolific queens, the matter of shallow stories is drawing the attention of a large number of critics. One man writes that the locating of the brood-nest in one, two or more separate bodies, has no influence whatever upon the amount of brood that the queen will produce. I am quite willing to agree that there is a possible difference in the experience of different apiarists on this subject, as mentioned on page 50 of the February number. But that the separation of the brood-chamber into two or more stories should make no difference whatever in the laying of the queen, is an untenable proposition.

Those of the readers who have the revised edition of "The Hive and Honeybee" are requested to turn to page 143, Fig. 59. Those who have only one of the original Langstroth editions are requested to look up Plate 1, Figs. 1 and 2, where the same cuts are found. They will there see that Mr. Langstroth at one time used frames with a perpendicular bar or partition in the middle. This bar had a groove in it which was intended for a "winter passage." As we tried nearly every invention Mr. Langstroth ever described, we also tried these perpendicular divisions and found that the queens would often breed on one side of them only.

The senior Dadant, who estimated the value of pieces of worker-comb very highly, was in the habit, before the invention of comb-foundation made broken worker-comb less valuable, of making horizontal partitions in brood-frames, in order to more readily fasten in pieces of worker-comb as small as 5 inches square. Often the queens would lay on the upper or lower side of such partitions to the exclusion of the other side. We also used divisible frames for making nuclei in queen-breeding. The same trouble exhibited itself. Anyone who cares to do so may try such experiments. Not in every case, but in many cases, perhaps one-fourth of the time, the queens would find such divisions an obstacle sufficient to cause them to turn away, for the time being, though they usually came back to them afterwards.

What, then, must it be when they have, not only a bar, but two bars and a beespace to pass over before changing from one story to another? It is true that they finally do it. But how much time is lost in hesitating and hunting can hardly be guessed.

There is a great deal of method in the queen's laying. To convince ourselves of this, it is only necessary to look at combs of brood. The older brood is usually in the center, the younger brood around the edges. The queen evidently goes around a circle and thus loses but little time looking for cells that are empty and ready. Otherwise how could she lay from 3,000 to 4,000 eggs in 24 hours? When, in the course of her laying, she gets to a wooden bar, she is directed out of her set path and evidently requires a little time to find the thread of her laying again. As often as this happens there is delay. That is why all those obstructions have been almost invariably set aside by practical men and often by the leaders themselves, who invented them. That is why so many people object to the Danzenbaker hive after using it. For the same reason, if the queen happens to locate herself in an upper story, there will be more or less difficulty in getting her back to the lower story, unless she is driven down.

There are advantages to shallow brood stories, else no one would ever adopt them. But there is no doubt that they interfere, more or less, with the full laying of the queens. This very objection to shallow stories, for brood, becomes an advantage when we consider them for surplus receptables. If the queens happen to go into them they will dislike them for the very reasons given above.

The Ithaca Short Course

On page 60, February number, we inserted the program of this Short Course organized, like that of California, by the United States Apiary Department, through Messrs. Phillips and Demuth, at the College of Agriculture of Cornell. It will be noticed that I was booked, in this course, for an address on "The Dadant System." This subject was not of my choosing, and I would have considered it vain on my part to make the attempt of going to New York State, where so many eminent beekeepers live, and preach the "Dadant System." But as my name was thus put forward by Dr. Phillips, in connection with our methods, there was nothing to do but go there and show, to the best of my ability, why and how we adopted large hives and an economical method of management.

There do not appear to be any better or more efficient teachers of good methods than Messrs. Phillips and Demuth, aided by such men as Dr. Rea and the list of beekeepers which were booked for the course. Everything that these men advance has passed the test of experience, sustained by sound reasoning and thorough acquaintance with the habits of bees.

I expected to find some opposition to the idea of large hives. I found nothing but concurrent statements and arguments. In fact, the train of discussion and statements led in the direction that I followed myself. So I could not speak to a better prepared audience, and was listened to very attentively.

Many influential and capable leaders in beekeeping of the East and Canada were present.

After leaving the pretty city of Ithaca and its college located in one of the most picturesque spots in the country, I had the pleasure to visit both of the Greiner brothers, long known as careful contributors of the American Bee Journal and whose portraits were given in our June, 1918, number. I also called upon Messrs. Taylor, of Newark, and Adams & Myers, of Ransomville, all practical men. On the way, through the zeal of Mr. Taylor, I had two bee conventions with a few beekeepers who kindly called upon me, during my stop at Rochester and at G. C. Greiner's home. Thanks, gentlemen, for this attention and courtesy. I certainly wish to speak of these visits more at length, but space forbids now.

At Ithaca I took a few notes of salient statements made by the leaders who spoke:

"Young bees that have never had a flight do not winter well, because their intestines are loaded with residues from their transformations from the larval and chrysalis states, which must be voided within a week or two after birth." This tallies with our experience in importing bees. The Italian shippers, at our request, tried, many years ago, the sending of queens, with freshly hatched young bees, with very old field workers and with young and active field workers. Success was altogether with the last mentioned, the worst being the young bees that had never flown. Bees that are imported from Italy are never less than 2 weeks in confinement, oftener 3 weeks or more, and the vitality of the workers is important.

"Shall we use tartaric acid in the syrup fed to bees, to secure a change from its sugar condition and prevent a hard crystallization?" It was shown that an ounce of this acid to 15 pounds of sugar would effectually prevent any crystallization. The change from cane sugar to grape sugar is fairly brought about in the stomach of the bees, if they have a sufficient length of time to work it over. The few instances of crystallization of sugar syrup fed were evidently due to too rapid storage.

Demuth's experiments show that bees can carry a third of their weight in honey readily.

Another experiment of Demuth was on the number of trips that a bee makes to the field in a day. I was astounded to hear that the average worker makes only 4 trips. I hope further tests will be made, in the time of a bouncing honey crop.

Demuth recommends to put on supers in number sufficient to permit the evaporation of the nectar and not just for storage only. He calls attention to the fact, well-known among beekeepers, that bees arriving from the fields place their honey in any vacant cell at hand and that this honey is afterwards re-handled by the young bees, thus ripening it. If there is more room than enough there will be a greater scattering of the nectar harvested and a consequently greater ease of ripening. This is sound sense.

"It is important to shelter the underside of the hives, as well as the sides and the top, in outdoor wintering." Evidently correct. The cold reaches the bees as well from the bottom as from the sides. We forget this too often.

"If the honey crop is delayed when the bees are ready for it, it may be advisable to make increase." This, of course, must be left to the judgment of every beekeeper, and he must be guided by the floral conditions, remembering that it takes about 35 days for bees to develop, from the day the egg is laid, to the active field worker. "We must rear our bees **for** the honey crop, not **on** the honey crop."—Demuth.

"A ten-frame Langstroth hive is too small for prolific queens." This seems to be now universally granted. —C. P. D.

A CALIFORNIA PIONEER

The Interesting Career of J. S. Harbison, the First Commercial Honey Producer on the Pacific Coast

BY FRANK C. PELLETT

IN the days of forty-nine and the early fifties, California was the goal of many adventurous spirits. The discovery of gold was the cause of great excitement on the coast, and hundreds of men made the long journey from the east. Some went by way of Cape Horn, while others crossed the Isthmus of Panama on foot. The writer has always found particular interest in the events of those stirring times, since a maternal grandfather was one of the number who early went to the golden west in search of the fortune which had so long eluded him. Having heard as a child so many wonderful tales of hardship and adventure, of sudden riches and sudden death, of beans at one dollar per pound and flour at fifty dollars a sack, of Indians eating grasshoppers and white men eaten by grizzly bears, the scenes of these events held a particular fascination for me.

While Harbison did not take the first bees to California, he was the first man to develop beekeeping as a commercial venture, and the first to take any considerable number of bees. It was a serious unertaking to transport bees to California in those days. There were no railroads, and it was necessary to keep the bees confined for a long period of time. It seems surprising that it was possible to take full colonies of bees for such a long journey and get them through alive.

The total distance traveled was nearly six thousand miles. It must be remembered that there were no railroads crossing the continent in those days. The bees were shipped by sea from the Atlantic coast to the Isthmus of Panama, freighted across the isthmus, and then came another long voyage to San Francisco and then up the Sacramento river. Mr. Harbison estimated the journey at 5,900 miles. Before going to California, Harbison had created something of a stir by selling the great total of a ton of honey, the product of his apiary at New Castle, Pa. At that time beekeeping was in its infancy and 2,000 pounds of honey was regarded as an enormous crop. According to reports, this achievement led many farmers in the east to embark in the business of honey production with more or less disastrous results. This was before the days of movable frame hives and beekeeping was more or less of an uncertain proposition. Between the disappointment of winter losses among his bees and the lure of the gold excitement in the west, Harbison decided to investigate the possibilities of California, and reached that State in 1854. The first shipment of bees, according to "Rambler," who gave an extended account of our subject in Gleanings, was made to California in 1853, with only one colony arriving alive.

In 1857 Mr. Harbison returned to the east and prepared 67 colonies from his own apiary in Pennsylvania, for the long journey to the Pacific Coast. The fact that he only lost five colonies on the journey bears evidence of his skill as a practical beekeeper. Another remarkable fact we learn that on his arrival, notwithstanding that bees were worth $100 a colony, he united his weak colonies so as to make all colonies strong enough. This was undoubtedly good beekeeping, but in the face of such high prices the temptation would be strong to sell the weak colonies, or at least to keep them in the hope of building them up. After the one successful trip, he went again and brought larger shipments. Of his various importations, he sold 240 colonies at $100 per colony. Others were encouraged by his success to embark in the same kind of enterprise, and in the fall of 1858, more than a thousand colonies were shipped, but in the hands of less skillful men, the venture was not successful, and less than 200 reached their destination alive.

While on his trip east, Harbison learned of Langstroth's invention of the movable frame. While he did not approve of the hive entirely, he was doubtless influenced to make some changes in his practice as a result of it, and made what came to be known as the Harbison hive. This hive came into general use in California, but is now seldom found.

To him, also, belongs the credit of inventing the section for comb honey. According to his own statement, he conceived the idea and made the first section during the last week of December, 1857, at Sutterville, Sacramento County, California. The sections used by Harbison held two pounds of comb honey, and in the fall of 1858 he exhibited 500 pounds of section honey at the State Fair, held at Maryville. The section was afterward modified to hold only one pound, but came into almost universal use for many years.

The Sacramento Valley did not long hold attraction for Harbison, and in 1869 he went to San Diego county, where in partnership with R. G. Clark, he embarked upon the business of honey production on a big scale. The mild climate of San Diego county is very favorable to the bees and in seasons when nectar secretion is at its best, phenomenal results are secured. During the recent short course several of the beekeepers told the writer of their experiences with making increase. Miss I. Asbec in one season increased from 5 colonies to 67 by natural swarming. The bees began swarming in February This was about 17 years ago. In 1914 Mr. J. H. Evans increased from 5 colonies to 90 by making artificial increase, and, in addition, secured a ton of honey.

It is not surprising that an expert beekeeper like Harbison, under such favorable conditions, should produce honey on such a scale as to attract the attention of the whole country. Mr. G. M. Hawley, of La Mesa, who was a friend of Harbison's for many years, informed the writer that there were 75 swarms in one day, at one of the apiaries in El Cajon mountain. Mr. R. G. Clark was in charge. With such excessive swarming, the surplus

The road through Harbison Canyon. Mr. Hawley in foreground

was undoubtedly reduced, but the amounts secured were large. In the American Bee Journal for October 5, 1889, Harbison gave an account of the invention of the section and of his shipments of comb honey to the eastern markets. In 1873 he shipped his first carload of section honey to Chicago. It was probably the first time so large a shipment had reached that market from one producer. This shipment, followed by others the next year, introduced the section to eastern beekeepers.

In 1876 Harbison shipped ten carloads at one time to New York. This was sufficient to attract the attention of the general public, and the New York Sun had an extended interview with the honey man from the west. M. H. Mendleson, of New York State, a young man much interested in beekeeping, saw this trainload of honey and was attracted to the possibilities of California for beekeeping. The big shipment of fine comb honey was sufficient to send him westward, where he has lived for many years and has, himself, become one of the best known and largest producers. The Harbison shipment totaled one hundred tons, and Mendleson has since produced a crop equal to that figure.

The interview in the New York Sun is an interesting account of the Harbison shipment and of his experiences in its production. He is credited with saying that he would not clear to exceed one thousand dollars for the entire shipment, after deducting expenses and interest on his investment. He employed fifteen men and found it necessary to move his equipment and product over rough mountain trails for many miles, thus making production and marketing extremely expensive.

When, during the San Diego short course, a trip was proposed to the site of the principal Harbison apiary in Harbison canyon, 20 miles east of San Diego, the invitation was eagerly accepted. Mr. W. H. Wineland, County Farm Advisor; G. M. Hawley, a local beekeeper; Dr. E. F. Phillips, E. R. Root and the writer composed the party. For most of the distance the roads are perfect, and we spun along over the finest paving. The road into the canyon, however, was rough and at times almost impassable. We found the surroundings much as they had been when Harbison lived there among his bees, except that all traces of his habitation have disappeared. Mr. Hawley is authority for the statement that at times he had as high as five hundred colonies in one yard and probably 3,000 colonies altogether. Our cover lustration is a picture of the mountain rising behind the site of the former Harbison home in the canyon. There is an abundance of white sage, black sage, summer buckwheat and wild alfalfa, all good sources of surplus. It seemed a little disappointing not to find any bees in this historic spot. Surely some beekeeper should find it an advantageous location even now.

As we viewed the great mountain rising behind the site of the former Harbison home, it was suggested that this should be Harbison mountain. Mr. Wineland volunteered to look the matter up and ascertain whether it had ever been officially named, and if not to convey to the authorities the wish of the entire party that it be named after the famous beeman who lived and labored beside it for so many years. We have since been informed that the mountain had not been previously named and that the authorities have seen fit to act on the suggestion and call it "Harbison Mountain." The canyon had long been known as Harbison Canyon.

About Inspection

I NOTICE what is said about foulbrood laws in the February number and also what is said about the Texas law in the January number. I would not advocate such a stringent law as Texas has, but unless we have something that will compel careless beekeepers to clean up, the law is largely a dead letter. I think we should have an inspector and deputies where needed and when disease is found, for the inspectors to clean up, or see that it is done. Many will not try, and many do not succeed when they do try. For an inspector to find disease and leave instructions and then go away with nothing done, does no good at all. I do not think there are 10 per cent of the number of bees in our county there were before foulbrood got a start, and I think this is true in a great many other places in our State.

J. W. ROUSE, Mexico, Mo.

The fortunate thing about foulbrood is that it does not put **good** beekeepers out of business. It is very inconvenient, causes some trouble and expense and a lot of annoyance. However, expert attention makes it possible to keep the disease under control and at the same time harvest some honey. This being the case, the problem resolves itself into making good beekeepers wherever the disease is present. Many very successful beekeepers date their success from the time when they began to fight foulbrood, and in some cases both American and European foulbrood are present. The writer could name some of the most successful beekeepers who make a business of harvesting big crops who are constantly fighting both diseases.

The fact of the matter is that in localities where principal stress has been paid to police power the beekeeping has declined, whereas in States where more attention has been given to education by the inspection force it has been built up in spite of the presence of disease. The fact that the business has improved in the face of disease, where educational methods are in operation, and has not done so by the police method, is a very good argument against the continuance of the old plan. In most of the States the tendency has been more and more toward educational methods for some time, and some States are abandoning quarantine methods entirely. While there should be sufficient law to prevent a man from continuing to expose his neighbors' bees to disease, needlessly, there is no justification in continuing the general practice of quarantine methods after a disease has become so generally diffused that there is no longer any hope of eradicating it entirely. Since educational methods have proved most effective, while at the same time accomplishing far more for less money, the interests of the beekeeper can apparently be better served by extending the new plan.—F. C. P.

Bluevine or Climbing Milkweed

(Also called Anglepod or Shoestring Vine.)

By E. A. Ragland.

YOU wanted to know about this vine and its nature. Well, I will say it comes up early in the spring a long, straight shoot at first and when it is about 2 feet high two

A group of beekeepers at the site of Harbison's former home

leaves something like a sweet potato plant come on at each joint. The joints and leaves are about 6 inches apart. It seems to grow best on low lands, but will grow on high hill land. It will run as far as 60 feet on wire fences. I noticed one on a guy wire to a telegraph pole that was at least 40 feet high. It begins blooming about the first of July and blooms until about the tenth of September. However, the bees do not pay any attention to it until about the latter part of July or the first of August. From then on, as long as the blossoms last, the bees hum after it. There are one or two clusters at each joint, something like basswood. The blooms are small, white, and range from 15 to 250 in a cluster. The vine is very small, about the size of a baling wire, and about as tough. This plant seems to do best dry years. The honey is about the color of Colorado alfalfa, but seldom seems to granulate, and has a very fine flavor. Nothing equals it, in my opinion. The seed pods begin forming in August and stay green until in November. The pods are almost like those of the milkweed. The seeds are also. They have a kind of cotton on one end. As soon as the pods are dry they split open and the seeds blow out and fly for miles. I have seen them 200 feet high. They remind me of cobwebs late in October.

Dr. Phillips, of Washington, D. C., was here last May and I was telling him about the plant. He said it produced carloads of honey in southern Indiana. There was a cornfield here of 1,200 acres and I don't think there was a stalk that did not have a shoestring vine on it. Dr. Phillips said they called it shoestring vine in Indiana, but he did not know the botanical name for it. I will enclose a small seed pod and a piece of vine. If you can figure out a name for it please let me know, and if it is so you can come over in August you can then see just what the bees think of it. You can smell the sweet odor for half a mile when the wind is just right. Brunswick, Mo.

(Dr. L. H. Pammel identifies the plant as *Genolubus Laevis*. It is common in Southern Illinois, Indiana and Ohio, where it is a persistent and troublesome weed. It also occurs in a few localities in Southern Iowa. We have numerous reports of this plant as an important source of surplus honey.—F. C. P.)

More About Shoestring Vine

This plant belongs to the milkweed family and "Bluevine" is only a local name for it. It grows rampant in the river bottoms of Southern Indiana, but does not seem to thrive on upland or thin clay soils.

It is my main stay for a white honey crop in the fall, and the honey excels white clover in beauty and taste. Mr. E. G. Baldwin, of the U. S. Department, has told me that some of the beekeepers in the extreme southern counties report a yield from this vine of 80 pounds in two weeks. I do not doubt this in the least. I just commenced taking this honey off today, October 2, 1918, and it will average 60 pounds per colony in three weeks.

The plant is a pest in the cornfields, as there is no killing it out, and the moment the cultivator stops it begins to climb the cornstalks. It has a string of miniature white flowers all along the vine and keeps blooming as it grows. I have seen it run up the brace wires of the telephone poles for 15 feet. It begins to bloom about August first and seldom lasts more than three weeks.

S. H. BURTON,
Washington, Ind.

Long Idea Hive with Supers

YOUR discussion on "Deep vs. Langstroth Frames," in the February number of the American Bee Journal, is very interesting, also your comment on the story-and-a-half hive.

What you say of the Danzenbaker hive is true, at least I have found it so. A single Danzenbaker brood-chamber is too small for even an ordinary queen, and I have been compelled to provide two-story brood-chambers for some that I have had.

I found this brood-chamber with its two sets of frames an unmitigated nuisance, and do not intend to use it next season.

I have gradually transferred my bees to Langstroth frames, and I am now building a number of the "Long Idea" hives. These hives are designed to hold thirty-three Langstroth frames and are arranged to take 10-frame hive-bodies as supers. I also intend to use these hive-bodies as winter cases, packing the bees in 10-frame Demuth cases, then placing them in groups of three, using three of the long hive-bodies tiered up for an outer case. I have planned to provide one cluster with an entrance in the end case, facing east; the other two entrances to be in the sides, facing south.

I have decided upon the "Long Idea" hive because it seemed to be the only way to enlarge the brood-chamber without abandoning the frames I now have.

As mine is only a side-line apiary, I am not always at liberty to give my bees the attention they require, such as enlarging the brood-chamber, cutting queen-cells, etc., things which seem necessary when the standard size brood-chamber is used. Do you think that expanding the brood-chamber laterally , as in the case of the "Long Idea" hive, will give results equal to those obtained with your Dadant-Quinby, or the Jumbo brood-frames?

I should like to have you answer this in the next issue of the American Bee Journal.

A. W. LEE, Tarrytown, N. Y.

(Experiences vary, and some people are pleased with things that others dislike. But my personal experience with the "Long Idea" hives was not satisfactory, though I am free to say that I would rather use them than the narrow brood-chambers, such as the 8-frame Langstroth.

The main trouble which I found with the long-idea hives is the ability of the queen to travel all over it and lay her eggs first at one end and then at the other, thus changing the location of the brood-combs. In this way we may find brood in any part of the hive at any time. When we extract there is always trouble in getting a sufficient number of combs free from brood, although the hive may be well stored with surplus.

Another trouble is in removing the honey for extracting. There is no way to exclude the bees as we do when we place a bee escape between super and body. So the combs have to be lifted out and the bees brushed off. This always enhances robbing.

For these reasons, we have discarded the "Long Idea" hive from our apiaries, after several years of trial. —C. P. D.)

(When used with supers as Mr. Lee suggests, I would expect rather satisfactory results from this arrangement. The "Long Idea" hive discussed by the editor was used without a super, thus requiring that frames be lifted from the body for extracting. As Mr. Lee will use it, there need not be much manipulation, since there are only 21 frames in the body. I have seen a similar plan tried with 17 frames and two 8-frame bodies side by side, for supers, with good results.—F. C. P.)

Marking Queens

By D. Queen

IN your January issue I observe an inquiry in regard to marking queens. Something like four years ago I became interested in this matter, but could find no information as to the method or the means to be used. I finally worked out the details, which proved satisfactory and practicable.

The "paint" is simply shellac dissolved in grain alcohol—preferably white shellac, although not essential. The coloring matter may be orange chrome, red lead, zinc white or any non-corrosive pigment in dry powdered form. Experience gained by experiment will soon show how much coloring pigment to mix with the shellac, also how thick the shellac should be. My outfit was made up of two small vials holding, say one-half ounce, and a small camel hair brush about the size of the lead of a pencil when it needs sharpening. These vials were set into a bit of inch board about 3 inches square. The brush was set through the cork of the shellac bottle a la mucilage, and dipped into the shellac far enough to charge the brush.

I personally object to handling queens, therefore my marking and clipping is done while the queen is upon the comb.

If these operations are done early in the day, while the air is rather cool, I find no difficulty.

This autumn I pinched the head off a marked queen, this being her third season, and still going strong, but not considered dependable for the work of building up in the spring.

Six were marked at the same time, and no effect was noticeable in the behavior of the queen or the bees. This queen was prolific this season and had a strong colony, but it stored a surplus of only 21¼ pounds. I was very enthusiastic at the time about marking queens, but realized that marking does not take the place of the clipping, and I finally decided that it was not worth the trouble.

Practice on drones or workers before attempting queens.

New Jersey.

Honey From Tobacco

In my first year in Porto Rico I noticed one morning that the bees were bringing in nectar abundantly. I traced the bees about half a mile and found them working in a tobacco field of about an acre or two. On my way I passed lots of tobacco in bloom without seeing a bee working on it. The particular field where the bees were busy had been neglected and was full of grass and weeds and the tobacco plants had suffered, the leaves and blooms hanging down, while in the adjoining fields which were well worked, the plants looked fresh and the flowers stood upright.

HENRY BRENNER, Seguin, Tex.

Nothing New Under the Sun

In the October issue of the American Bee Journal a feeder is described under the heading "A New Feeder." It is now some 40 years since I designed or invented a similar feeder and gave a description of it in the British Bee Journal. A good thing, but it did not "take on."

A. D. CAMERON,
Druimchruaid, Scotland.

BEEKEEPERS BY THE WAY

Migratory Graham

There is no more interesting character on the Pacific Coast than Migratory Graham. Known and feared from the Canadian line to the Mexican border, no man moves more frequently or has a wider beekeeping experience than he. Beginning his career in San Diego County at the age of 15 years, he has kept bees in 32 California counties and in five valleys of Nevada.

Wherever beekeepers congregate one hears tales of the exploits of Migratory Graham. According to his own statement he has shipped 161 cars of bees. When one stops to consider the labor of preparing and shipping a car of bees it seems amazing that one man should live to carry on the shipping of bees on such a scale. This would mean an average of eight cars a year for twenty years.

Graham figures that by frequent moving one can get several crops a year in California. As a typical example of the possibilities in this direction, he suggests building up in spring in the almond belt of Butte or Colusa Counties. From here he would move to the orange in Tulare County, then back to the Sacramento or San Joachim Valley to the domestic seed belt. From here he would move to Northern California for an alfalfa flow, and then south again for Jackass clover.

A famous migratory beekeeper

Graham has had more ups and downs than fall to the lot of the average man who aspires to do things on a large scale. At one time he had 3,000 colonies of bees and the best equipment on the Pacific coast and produced a crop of 240,000 pounds by the practice of migration. From that he has reached the other extreme with neither bees nor equipment, and is now again on the up grade with 600 colonies.

Graham has been freely charged with spreading foulbrood all up and down the coast and has been the target for much violent criticism. Special ordinances have been passed to keep him out of special territory and he has been arrested and fined times almost without number. When the writer enquired how many times he had been arrested for violation of ordinances, he replied that nobody knew.

Neither ordinances or quarantines, fines or imprisonment have been sufficient to keep him from moving, and the beekeepers of a favored locality are often surprised on going out some morning to find a big apiary offering its competition for the honey-flow. However, he seldom remains long in a place, and as soon as the flow is over he leaves as mysteriously as he came.

Migratory Graham is undoubtedly one of the most capable beekeepers of the time, yet his life has been far from a pleasant one. Few men are more adaptable than he is reported to be. It is said that in the days of his prosperity he dressed the part of a gentleman of leisure and would readily have passed for a foreign nobleman with his high hat and cane. In days of adversity he can play the part of a tramp and make himself comfortable with the barest necessities with equal ease. The world may never see his like again.

Does Corn Produce Nectar?

I NOTICE that this subject is now coming in for discusston in the American Bee Journal, and I will offer some thoughts on the subject for what they are worth. I have been keeping bees ever since I was 14 years of age and have always been advised that common Indian corn or maize does not produce nectar. The fact of the matter is the botanical rule holds that all plants that are wind pollinating do not produce nectar, while all the plants that are insect pollinating do. I think that this will hold good as a rule in corn, as it is one of the wind pollinators. My observations show for many years that bees do not work on corn for honey, but do so for pollen. I have seen the bees working on the silks of corn many times, and have good reason to believe that they gather some little sweet substance therefrom at times, but in so slight an amount that it is not worth while to mention. I have seen the bees picking up pollen from the silks of the corn on two occasions, and one year I saw the bees gathering aphide secretions from the corn. I know that this was true from the fact that much of the corn had a goodly amount of aphides (lice) on it. It is my observation that bees do not gather honey from corn to count at all. I must say in this connection that it is easy to believe that bees gather honey from corn, since there are many honey-bearing plants that are producing at the time corn is at its best. As a pollen-producer the corn cannot be excelled, sometimes. During the latter part of June and the first part of July, 1917, I witnessed the greatest collection of pollen from corn that I ever saw. We had a great drought here in Texas at that time and the corn just bunched to tassel. About half of the corn pushed the tassel about half out of the boot and stopped growing suddenly. The tassel was well enough developed to produce pollen, and as the blades of corn formed a funnel around the tassel the pollen fell into this funnel and lay in heaps, sometimes more than an inch deep. At this time there was nothing for the bees to do but gather the pollen, and my bees put in great slabs of this pollen. It was so dry here that all other vegetation had dried up and there was not an ounce of honey in the country, but about ten days later the cotton began to give a faint tinge of honey. These conditions continued until in September, when a few light showers came and a little honey came, so that the bees could gather enough for winter. We thought that these fearfully dry conditions would cease at the end of 1917, but they continued all through 1918, and we had a repetition of the corn conditions of 1917, but had more honey in the cotton, and the bees did better. Neither of these years showed that bees gathered honey from corn.

T. P. ROBINSON, Bartlett, Tex.

A New Yorker's Observation

I have seen bees on both tassels and silks, and have also seen them

work on the stalks, sucking the juice from the corn wherever a stalk was broken or cracked, and I always thought that they took the sweet juice from broken stalks and converted the sugar to honey, and I know that my bees gather a large amount of pollen from the corn tassels.

GAROLD PETTYS,
Chase Mills, N. Y.

A Word From Missouri

I will answer your inquiry in regard to "Do Bees Get Honey From Corn?" I think that I know some thing about that. I was raised in a corn country and have been a keeper of bees for several years. A great many times the honey flow would be short about the time Indian corn would tassel out. I always thought when the Indian corn tasseled out and silked that my bees would be all right; but I was sadly disappointed. By close observations, which I conducted many a morning, I would find my busy little Italians going to and from the hives, working very hard in a near by cornfield; but on examining the hives I would find no nectar and worlds of cream-colored pollen; so that convinced me that they do not get anything off of Indian corn but pollen.

P. J. CRAFT, Liberal, Mo.

From Georgia

"Do Bees Get Honey From Corn?" You asked the readers to answer the question. My answer is they do not get honey from corn; they do get pollen. I have ten outyards in a rich corn section, big swamp land and rich loam made or covered bottom land, and if it yielded honey I would get some. I do get honey at that time which comes from the buttonwood bush, also from the marsh lily or a marsh flower that blooms at the time that corn is in tassel; it is a low grade of honey. I used to believe that it came from corn, but a search proved that it did not.

W. L. WILDER, Macon, Ga.

Wisconsin Says No

Replying to your query as to bees gathering honey from corn, will say I believe for the past 40 years I have been as close and careful an observer as anyone, and I have the first time yet to see a bee working on corn silk or any other part of corn excepting the tassel, from which they gather pollen in large quantities.

So sure am I that they do not get honey from it at all, and notwithstanding the reports of bees storing large quantities of honey from corn tassel, I wil pay $1 per pound for a 60-pound can of pure corn tassel honey. Now don't all you corn honey men run and rush in your crop, as you may swamp me.

ELIAS FOX, Union Center, Wis.

A Word From Texas

The tassel of the corn yields pollen early, and some honey later on. If the weather is favorable for the reproduction of plant lice, we may always expect them to attack the tassel, making the top leaves "sticky" and discolored. I have seen bees pile on the tassel until you could scarcely see anything but the bees gathering this honeydew. The honey thus obtained is dark, but of very fair flavor. —Wm. R. Howard, White Rock, Tex., American Bee Journal, page 225, May, 1880.

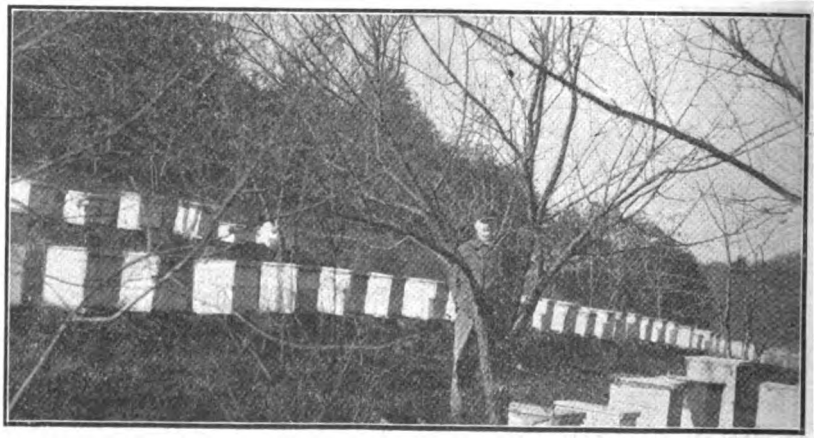
"Springing" Bees

By D. A. Macdonald

MUCH has been written about wintering bees, as the pages of all bee papers, year after year clearly testify. Less, too little space, has been devoted to the subject of "springing" bees. Yet on nothing else does success or failure more strongly depend. With the advent of spring the cares and worries of bees and beekeepers manifest themselves. Hitherto the winter cluster kept warm and dry, with plenty of bees and ample stores, the problem has been a simple one. Henceforward it will become more and more complex, because so many side factors intrude. Happy now are all who did their spring stimulation in autumn, who fed their bees with abundance of stores well matured, well made and well sealed, for they can now fold their hands and feel calmly content. Stores present, a good queen heading the colony, plenty of young bees breeding will go on apace. Early in spring, sometime in February, the brood area will be small, at first only a tiny patch or two on the central frame. No anxiety need be felt as yet, for this is the natural routine of each successive spring in every hive. With March, however, activities develop at a different pace in different localities, depending principally on various altitudes, and different degrees north or south of the Equator. Many side factors arise—the bees, the queen, the quantity and quality of stores, the available supply of pollen, the nearness of the water required, all affect results beneficially or prejudicially.

Here, at the very outset, we find a sharp cleavage of both opinion and practice over this problem of "springing" bees successfully. One set of advocates preaches the doctrine of "let 'em alone," holding that right through the spring months of February, March and April bees are best left to their own devices, and that the prescient little worker bees of the colony know what is for the present best interests and future well-being of the community as a whole. Given, they say, ample stores, 30 to 40 pounds in late September, to be well matured and carefully sealed in early October, left under the care of the bees in a well-made hive, and you have the very best provision and guarantee for bringing each colony safely through not only the winter months, but also the three succeeding months of spring without any outside aid. Not only that, but they contend any interference would be detrimental to the bees. They, in their spirit of forethought, have so arranged their stores and their broodnest that everything is in apple-pie order for even the severest winter and early spring. The beekeeper's meddling, they contend, would not work for good, but evil. Interference from outside would break up the cluster, disturb the quiet and orderly arrangements presciently maintained by the "spirit of the hive," while the agitation produced would prematurely encourage a start in breeding, thus producing young bees untimely, with all the consequential drain in stores, premature search for both heat-forming and flesh-forming food for the nourishment of the young larvæ. The search for water, too, overtaxes the strength and endurance of the diligent workers, and they age before their due time. One of the most earnest advocates of the first system of spring treatment has summarized the whole procedure in the graphic phrase, "millions of honey in our house," and another leading light, still with us, says, "The most satisfactory way of stimulating brood-rearing, for me, is to see that the bees have plenty—yes, more than plenty, abundance—of stores in autumn, and then leave them entirely alone. Queens do their best without the lash."

Those who preach and practice stimulation in spring are fully as confident and enthusiastic in commending and advocating their own special tenets and doctrines. Bees, they contend, want a rousing up in spring, a sort of that shaking up whose beneficial influence is pleaded for by many successful beekeepers in many lands. Therefore, they start in spring to stoke the bees in their desire that they should stoke the queen.



Apiary built up from colony caught in bee-tree. Fred W. Krome, Black River Falls, Wis.

They force the pace, and seek to accelerate the energies and desires of the queen for ovipositing. Jog trot procedure is not for them, even the speed of an express train is too slow, and they wish to hurry on at the rate of an aeroplane. If seasons were always good, if supplies were always available, if queens could last forever, this would be an ideal procedure—perhaps. But seasons are variable, the flow of nectar uncertain, and so checks, hindrances, deterrent influences, intervene, making frequently the last state of the stimulated tock worse than the first. The colony attains the crest of the wave at too early a date, the big battalions reach the maximum before nectar is to be had in anything like a copious flow. If there is any one golden rule in apiculture more valuable than any other it is this: Bees should be at their strongest just when the flow is at its best. The two should synchronize as to time. A week too early or too late may mean that the bees have missed that tide which, taken at the flood, leads on to success.

I am not personally a strong advocate of either of these extremes. I certainly don't belong to the stimulative party, but I would not strongly advise to let the bees severely alone. Rather seek for and find the golden mean between the two extremes. Bees are all the better for the guiding hand of their owners in spring, then perhaps more than at any other season of the year. The iron hand in the velvet glove may be too harsh a simile, the moral suasion which guides and directs without manifesting its presence might be better. Early, very early, discover if the bees are all alive, if stores are holding out, if breeding is in satisfactory progress, if the interior guarantees the community is warm and dry.

Few will dispute that the less agitation created early in the spring, the better it will be for the welfare of the community; but when milder days arrive, when honey is available even in driblets, one can safely expedite matters gently and steadily, both in and out of the hive. Inside a slight scratching or piercing of comb-cappings, near the brood-nest, occasionally leads the bees to think that they have a supply of easily available stores to keep the queen laying steadily. Outside, a supply of artificial pollen will still further encourage brood-rearing. This works for good and not evil. There is practically little or no sudden rousing of the bees, little disintegrating of the cluster, little disturbance of the brood area. Bees near the bleeding honey quietly transport it to the combs frequented by the nurse bees and they stoke the queen, not unduly, and so bring on brood-rearing.

No hard and fast lines can be laid down. What applies to one man does not apply to another. What applies to one season only partly applies to another. In particular, what applies to one altitude, or degree of latitude, must be modified and varied when applied to another. Herein lies a fertile source for discussion of this thorny subject, the best way of bringing bees safely through early spring.

Banff, Scotland.

Gassed Soldiers Raising Bees

By J. W. Harting

BEE raising offers to the gassed soldier or the man broken in health from the hardships of trench warfare a profitable occupation. Based on an original gift of 20 hives by the American Red Cross, bee raising as an employment for soldiers recovering from wounds or fever, is being developed in the vicinity of Verdun, where reconstruction is receiving expert consideration. The gift was made to M. Grillon, the sous-prefect of Verdun.

The Friends' unit of the American Red Cross, which is doing this specific work, hopes that in a few months it will have enough bees for everyone who kept bees before the war. The Friends are also helping to run dairy farms, hospital and health exhibits and have put up refugee barracks. They have created communal gardens and are arranging to equip the farmers who are beginning to return to their land. A central base has been established on the farm of La Grange-le-Comte and there is being developed at Vanault-les-Dames, in the Marne section, a stock-raising farm where chickens, rabbits and pigs are being raised and where some sheep, horses and cows are also being kept for future distribution in the Argonne region.

The work of raising bees conforms well to the needs of the man unfit for the heavier agricultural work, and therefore every encouragement is being given the industry by the Red Cross.

Grace Allen in her apiary

The Dignity of Beekeeping

By Mrs. Armstrong Allen

PEOPLE who live in cities easily acquire habits. (Living there myself, I know.) People who live outside of cities have habits, too, but being quite different, they can scarcely be used to point the same moral or adorn the same tale. The particular habit haunting this particular beekeeper today is characteristic of a large, though possibly decreasing, class in cities and towns. If it is decreasing, the happy change is doubtless due to the war, the one great recent maker and breaker of habits.

Only too long it has been the way of business men to smile at the mention of rural pursuits, country occupations. Some smile broadly, openly, frankly, and often in friendly wise—yet they smile. Others smile ever so slightly, with just their eyes perhaps, or the ends of their lips—maybe only one end—still they smile. While still others, eyes and lips more careful servants, may show no sign at all—yet they, too, smile, inside. Farmers and gardeners, dairymen, poultrymen and beekeepers, have felt this, and resented it, for generations. I remember having heard a man of education and scientific training, a teacher of chemistry, speak of it—Dr. J. S. Ward, for several years our State inspector. "It makes me three-thirds mad," was what he said one day at a beekeepers' meeting, "it actually makes me three-thirds mad to see the look some people get on when I speak of beekeeping." It was that same smile—that same city habit.

Yet, after all, there is nothing more serious back of it all than a superficial misapprehension, a little lack of information. The man who, when beekeeping is mentioned, puts on a look that makes the educated beekeeper three-thirds mad, just does not understand the status of beekeeping. We who do can well afford just to smile back—a different kind of smile. For beekeeping is not a cheap or crude or insignificant thing

to do. It is important in the life of the people, and it is dignified. To think that a factory is more important than an apiary, or a manufacturer more dignified than a beekeeper is a mistake. The boasted high efficiency of up-to-date industry is something new, something modern, something smacking of the Nineteenth and Twentieth Centuries. The efficiency of the hive is old, even classic, linking itself with the days of David and Solomon, or Virgil or Aristotle. And to an efficiency like unto that of the hive does the beekeeper himself aspire. The roar of the city is something to hurt both ears and souls. The hum of the hive is of the very stuff of quietness, and peace and poise.

Sometimes it seems as though perhaps the words beekeeper, beekeeping, may be part of the trouble. Perhaps, if we care much for a greater show of respect from those who are steeped in the ways and the phrase of the marketplace, we should be to them always as the moon is to the earth. Show them only one side. and let that be the business side, the side of the honey production. Call yourself a honey producer, and see if that doesn't help. It utterly changes the picture. Say beekeeper to me, for instance, and I see the most charming things—white hives on green grass under the trees, probably in an old orchard. I have even a queer trick of putting a lovable old man into the picture, an old man full of rich philosophies, doing things quietly and a bit leisurely. Of course, that is really absurd, because it has been given me to have a wide enough acquaintance among beekeepers to know that they are not always lovable old men! If one who knows somewhat of the beekeeping world thus unconsciously persists in inaccuracies in a generalized picture, may not our friends of the factory and the countinghouse do the same? Say beekeeper to them, and who knows what they see? Probably they conjure up a mental picture of a few neglected old "gums" presided over by a backwoodsman or a hill billy. So they smile. As we do, also, at that particular picture.

But say honey producer. Immediately I lose my nice old man under the orchard trees, and the man of the marketplace loses his hill billy with the bee gums, and we both see strong, up-to-date, keen, energetic men loading a food commodity into a car. And the man of the marketplace ceases to smile, for here he sees the very qualities to which he bows with respect—alertness, good management, hustle, modern methods, success.

But whatever we call ourselves, beekeepers or honey producers, whether people who live in cities smile or salute, we may rest quietly on the realization of the genuine dignity of our work. It is a work that uses hands and brains—and hearts. It has brought no problems to add to the increasing complexities of modern industrialism. Labor has no long score, no aching grudge, to settle with us. Bolshevism grows neither from our ranks nor as a reaction against us. And we are producers of a foodstuff of real value. Moreover, no store or bank, not even the boasted sunlight factories, could be made as hygienic as our apiaries. The worthwhile beekeeper keeps them so. It was God made them so, in the beginning. And to the wholesomeness of His air and sun, he added bird song and the beauty of blossoming things and the indescribable charm of the bees themselves—that old charm woven of swift wings and mysterious ways and the most soul-resting sound in the world.

In My Beeyard

I wish the maddened, saddened world
  Could sit down here with me
And look away across the day
  And see the things I see.
No splendid vista there would show—
Just beehives in a quiet row,
  And the blue beyond the tree.

But Oh, while you're sitting and looking
  Across the hives to the blue,
From somewhere softly stealing
Comes over you the feeling
  Of old dreams coming true.

I wish the tired and tortured world
  Could come from east and west
And hear the bees beneath the trees
  Returning from their quest.
'Twould heal the very soul of them,
The worn and weary whole of them,
  And give them utter rest.

For Oh, while you're listening quiet,
  Beneath the bending trees,
From somewhere softly blowing,
The peace of God comes flowing
  Right through the humming bees.

Nashville, Tenn.

Texas Inspection Meeting

The Apiary Inspectors of Texas met in College Station on January 24 and 25. This was the second annual meeting held under the new plan of co-ordinating the efforts of the various County Inspectors into an Educational force under the leadership of Mr. F. B. Paddock, State Entomologist.

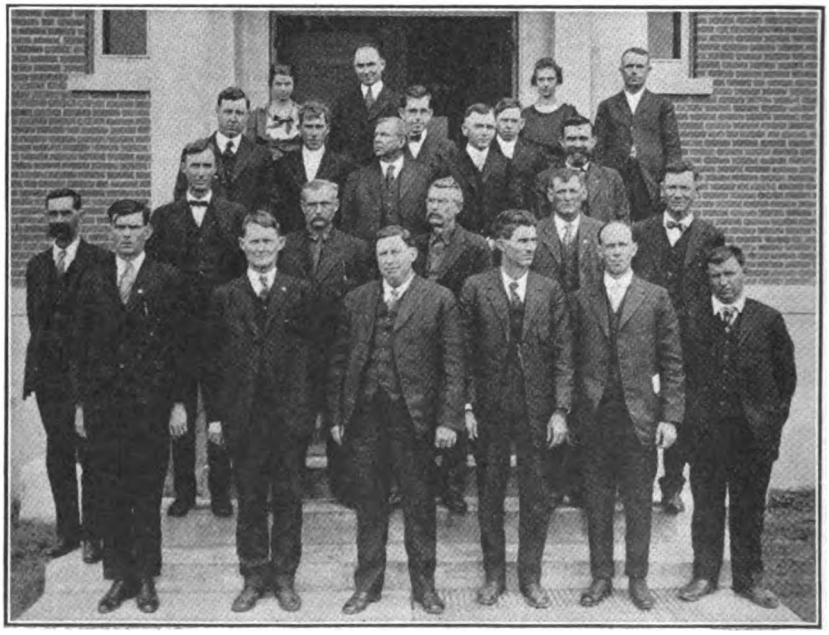
In the forenoon of Friday, Mr. H. B. Parks, of the Extension Department, outlined the work now being done in educating the box-hive beekeeper of the more backward developed counties to adopt modern methods. The Extension Department and the law enforcement agencies are now working together along the lines of awakening interest and enthusiasm in beekeeping.

Professor S. W. Bilsing outlined the work of his class in beekeeping at the A. & M. College, and at the final meeting of the inspectors demonstrated by a visit to the College apiary, the work of the boys in his class.

More flexible and sensible regulations were adopted covering the shipment of honey from and into quarantined areas. The rigid regulation heretofore in effect had been found unworkable and a form of certificates to accompany future shipments was adopted that will tend to place more responsibility upon the producer himself and awaken him to a realization of the possible dangers of shipping infected honey.

Strong representations were made to the State Legislature now in session looking toward the establishment of State Experimental Apiaries for the study of beekeeping under Texas floral and climatic conditions. Since this meeting a bill has been introduced in the Legislature providing $6,000 for the establishment of these apiaries and for the expenses of maintenance and operation.

, E. G. LESTOURGEON.



Texas Inspectors at College Station

DR. MILLER'S ANSWERS

Send Questions either to the office of the American Bee Journal or direct to DR. C. C. MILLER, MARENGO, ILL.. He does NOT answer bee-keeping questions by mail.

Black Beeswax

I have a chunk of beeswax which is as dark as pitch. I have melted it in a sun wax extractor; also have melted it with hot water, but the color remains unchanged. What process is best to refine wax?

ILLINOIS.

ANSWER.—I do not know, unless you use acid. If there's any better way Editor Dadant will know it.

(You do not say how it was blackened. If it was by the use of a rusty kettle, it will be hard to bring it back to good color. You might succeed by melting it several times in the sun extractor.—Ed.)

Package Bees

I have recently sent an order for 25 2-lb. packages of bees with queens to be delivered about the 1st to 15th of next June. What would be the best plan for handling these bees? I am using 10-frame Langstroth hives. Could I put in full sheets of foundation and hive them on two or three frames with a division-board, feed them awhile and gradually increase the broodnest and get them built up to full colonies by fall, so as not to require feeding or doubling up for the winter? The yellow sweet clover generally begins blooming here about the 10th to 15th of June, and alfalfa about the 15th to 20th of June, and hay harvest begins the last week in June, sometimes the first week in July, and swarming season the middle of July to 1st of August. I have read your books, but they say very little about handling bees in packages, and most of your increase was made with fully drawn combs, and not with foundation.

WYOMING.

ANSWER.—Yes, you can do as you propose, putting the bees on three frames of foundation with division-board and gradually enlarging; but if weather is hot it is doubtful if it will be worth while to use the division-board. Neither will it be worth while to feed if the bees get a reasonable amount of honey from the field so that their combs are never without honey. A package of bees with queen is to be treated just as you would treat a swarm, and you will probably find no difficulty in the management. You ay I had drawn combs in making increase. Well, foundation would be the same, only the bees will get along a little faster with the comb. So far as you have them to spare it will be well to give combs of honey, giving one to each nucleus, and frames of brood and honey will be still better.

Finding the Queen

I want Dr. Miller to tell me through the Journal—because I believe others would like to know the same thing—how to find the queen in a hive. I have had bees for five or six years and have found one on one or two occasions, and have been unsuccessful on occasions too numerous to relate.

OKLAHOMA.

ANSWER.—There's no trick about it, and if you keep on trying to find queens, most likely you will wonder that you ever thought it hard. Use as little smoke as possible, for if you smoke so much as to set the bees running it's all day with finding queens. But smoke enough to keep the bees in subjection. The queen is nearly always on the brood; so lift out the frame or frames at the side until you come to the first frame with brood. When possible, sit with your back to the sun, so you can see better. As you gently lift out the comb keep watch for the queen on the side of the comb next to you, but as soon as the comb is lifted out examine carefully the other side, and then return for another look at the side next you. Continue in this way till you have been over all the combs, and if necessary repeat the whole performance. If you do not find her on the second time going over, you may save time by closing the hive until an hour or more later, or until the next day. Handle the combs very gently; a jar is as bad as too much smoke. My assistant is an expert at finding queens, and I've given you her way.

Transferring—Packing

1. I have three colonies of bees which I purchased late last fall, and as we had a poor flow, did not transfer them, but would like to early this spring. Would it do for me to drum them out of the old hive about first bloom time into another hive, then set the new hive above the old one with a separator between them? Would this hinder brood-raising to any extent?

2. I packed my bees last fall in individual packing cases with about 6 inches of leaves all around, then I put burlap in the bottom of super and filled it with leaves, leaving the hive top off. I filled the packing case on up, this making about 12 inches of packing above the bees. Then I put on the top of the packing case, which is covered with tarred paper. I then bored two 1-inch holes just below the roof for ventilation. The hive sets about 6 inches higher than the bottom of the packing case. I put the opening of the packing case at the bottom and put a slanting chute from the hive entrance to the packing case entrance. Will that help the bees any to keep the dead bees out of their entrances? Packing case entrance is three-eighths by 4 inches. Hive entrance three-eighths by full width.

3. The dead bees seem to come out fine and the bees seem to be doing just fine. We have had two or three warm days here of late and every hive has taken one day's flight. They looked like they would swarm, they were out so thick, but up till then they have never been out that I know of, and I find very few dead bees at the entrances. Don't you think that would indicate they were doing well?

ILLINOIS.

ANSWERS.—1 I think not.

2. I suspect it would be as well if you had bored only one hole instead of two. That slanting entrance would make it at least a little easier for the bees to keep the dead bees cleared away.

3. You would be hard to please if you were not satisfied with their behavior. Still, you have not reached the time of greatest mortality, your letter being dated January 19. You will probably find that more bees will die in the last month of confinement than in all the previous time. They are evidently wintering well.

Size of Frames—Packing

1. I am a beginner in beekeeping. I expect to work for extracted honey As all frames in the apiary should be the same size, what hives and what size frames would you advise me to get? Some say the queens will lay more eggs in large frames than in small ones.

2. What size pocket honey extractor would you advise me to get?

3. Can a 9⅛-inch frame be successfully extracted in a 12-inch pocket honey extractor?

4. What is the best to put over the broodframes, straw mats, oil cloth, or just the cover alone?

5. There is no rye straw around here. Could mats be made out of timothy hay?

6. When do you examine your bees for the first time in spring? Do you examine them at their first flight, or do you wait two or three weeks later?

7. Do you disturb your bees on warm winter days to make them fly?

8. I have often read: Dark honey should not be left in the hive in fall, as it causes dysentery. How about buckwheat honey?

IOWA.

ANSWERS.—1. Some agree with the Dadants that it is better to have extracting frames shallower than the brood-frames. You will do well to have 10-frame dovetailed hives, unless you have the Dadant. Like enough queens may lay at least a little more in large frames.

2. That depends on the size of your extracting-combs. The pockets should be at least large enough to take the frames easily.

3. Yes.

4. As you appear to winter outdoors, you should have straw mats or something to take their place.

5. I'm afraid not. Leaves are excellent for packing.

6. Sometimes on the day they are taken from cellar, but usually not till some warm day a week or more later.

7. No; because I winter in the cellar.

8. Buckwheat honey is good for wintering.

Insulating Materials

On page 24 of the January issue is an interesting table of the relative insulating value of a few packing materials. Where, in your judgment, would hay and straw, nicely packed, stand in this list?

NEW YORK.

ANSWER.—I don't know, but should think it would come in between dead air space and corrugated cardboard.

Swarm Control

1. I have three stands of bees in 10-frame hives. Two stands are blacks and the third I requeened last spring with an Italian queen. I wish to limit them to 4 stands, total, next spring, and intend to let my strongest blacks swarm, but intend to clip the queens of the other two early, and then kill them when they come out to swarm. What better way would you suggest that will give me my objective and still keep the bees happy?. My bees are located on a small town lot.

2. In what way would a change of next season, from normal, influence these plants?

INDIANA.

ANSWERS.—1. When a colony swarms and you kill its queen and then leave it to its own devices, there's hardly anything surer than that it will swarm again in a week or so. You may avoid this if you kill all cells but one.

Perhaps you might like to have all Italians, and this might suit you: Call the Italian A, and the two blacks B and C, and let them stand thus:

A B C

Strengthen A by giving it frames of sealed brood from B and C, with or without adhering bees. That will make A swarm first. When it swarms, set the swarm, which we will call D, in place of A, put A in place of B, and set B on a new stand, thus:

D A C B

In perhaps eight days A should swarm again, when you will put the swarm E in place of A, put A in place of C, and put C close beside B, thus:

D E A BC

When A swarms again, put the swarm F in place of A, and put A close beside B and C, thus:

D E F BCA

A week later kill the queens of B and C, and four or five days later kill all cells in B and C and pile them on A. Thus you have your four colonies with an Italian queen in each.

2. A season might be so poor that the bees would not swarm.

Drawn Combs for Swarms

1. If, when a colony swarms, a hive full of drawn combs is given, will not the bees immediately fill them with honey and soon crowd the queen very badly?

2. Is there not likely to be another swarm sooner where drawn combs are used?

3. My queens are clipped. I move the old hive to a new stand, replace it with another of full sheets of foundation, yet I have had several cases in each of the past three seasons where the bees have reared more cells and in due time swarmed again. I use the 10-frame double-walled hive. (My spring count of colonies for these seasons has not been above fifteen.) Can you suggest a cause for such actions?

4. The above condition applies to natural swarming when I caught them in the act. The same experience has been true with us when brushing, though several times I have had several colonies all go together, leaving a queen and only a few bees on the old stand, this happening once or twice after the swarm had drawn quite a little comb, and the queens laying.

5. If, in transferring from a box-hive the bees are drummed into a box and emptied into a modern hive with some drawn combs, the box-hive turned upside down and a queen excluder put on it, and then the modern hive above that, making sure, of course, the queen is in the top hive, will the bees rob out the lower hive? All entrances to the lower hive would be stopped of course. If done early in the season, perhaps even before fruit-bloom, if some honey was provided in the drawn-combs, would this not be a reasonably good way of transferring and getting rid of a sticky mess? VERMONT.

ANSWERS.—1. Honey will be promptly filled into the cells, perhaps in the center of the brood-chamber, but if it gets in the queen's way it will be emptied out again, and unless she is very old the queen will not be restricted in her laying.

2. If you mean another swarm from the old hive, that will not be affected in the least by the combs or the foundation given to the prime swarm. If you mean a swarm from the swarm (what is called a virgin swarm), likely drawn combs would have some tendency to hasten the swarming; but virgin swarms are so rare as to need little consideration.

3. Let me see whether I get you straight. When the swarm issues, you set the swarm on the old stand and at the same time set the old hive on a new stand some distance away. Afterswarms are likely to follow. Try it this way: Set the swarm on the old stand and the old hive close beside it; then, 7 or 8 days later, move the old hive to a new stand ome distance away. See if that doesn't turn the trick. You see, in the last case you move the old hive about the time it is ready to send out the first afterswarm; the hive loses its field force, which joins the swarm, and this so weakens and discourages the mother colony that all thought of further swarming is given up.

4. I'm not sure I understand just what does occur. If you'll try again, giving very full particulars, maybe I can help you out, and maybe I can't.

5. I'm not sure just how the thing would turn out. I should expect that in some cases work would be promtly commenced in the upper hives, and in some cases there would be sulking. but work begun sooner or later. In either case the brood in the old hive would be cared for until it hatched, and then the honey might be carried up promptly, but oftener rather slowly.

Illinois Association

1. What real benefit would I have in joining our Illinois Beekeepers' Association?
2. What are the annual dues?
3. To whom must I write for membership? ILLINOIS.

ANSWERS.—1. If you should attend one of the meetings of the Association you would not begrudge several times the cost. The wide-awake discussions bring out points of value that might not otherwise be brought out, and some will value equally the opportunity between sessions to meet old acquaintances and to make new ones, coming in close contact with those who are leaders in our pursuit. Whether you attend the meetings or not, you will greatly value the excellent report annually issued to the members, giving full account of proceedings at the meeting, and also a report of the Chicago-Northwestern meeting. It would take too much room to tell of the different things that have been accomplished through associations of beekeepers. No telling what new things may be accomplished through organization which are not likely to be accomplished without it.

2. One dollar.

3. Jas. A. Stone, Farmingdale, Ill., is secretary.

Swarm Control

Please publish in your journal how Dr. Miller checks bees from swarming; for running to comb honey. NEW YORK.

ANSWERS.—Particulars of all I have done in the way of trying to prevent swarming would more than fill this journal. The gist of it is that when you find queen-cells started you must kill them and make the colony queenless for 10 days. If you cage the queen in the hive for 10 days, the colony may need to be treated again, but if you remove the queen and at the end of 10 days introduce a young laying queen there will be no more swarming that year.

Dadant-Langstroth Hives

1. Will not the queen lay more in the Dadant or Jumbo than in the Langstroth, and more in the Langstroth than in the divisible brood-chamber hive?

2. I see that the Dadants obtained 125,000 pounds of extracted honey from 500 hives and that Atwater, of Idaho, realized 100,000 pounds from 1,000 hives of the Langstroth pattern. If the pasturage in both localities is the same, as no doubt it is, is not this a solid argument in favor of the deep frame for the extracted honey production?

3. Will not the use of frames in a hive help to keep the bees from swarming and also tend to increase the size of the bees?

4. I see that A. C. Miller places the 10-frame hive on the Jumbo for supers. Could this also be done with the Dadant? I am under the impression that the latter is wider, deeper and longer than the Jumbo. MICHIGAN.

ANSWERS.—1. The larger the hive, the more a queen will lay, so long as the capacity of the hive is less than the capacity of the queen. But when the capacity of the queen is reached, then increasing the size of the hive will not increase the laying of the queen. A queen may lay more in a divisible-chamber hive than in a Dadant if there are enough stories in the former, and if the queen can lay more than the Dadant will hold. A queen will likely lay a little more in a Dadant than in a divisible of exactly the same capacity, but the difference, especially in hot weather, is perhaps less than generally supposed.

2. I am quite inclined to the opinion that the Dadant may be better than the Langstroth, but it is far from being proven by what you say. How do you know the pasturage was the same? How do you know that other conditions and management were the same? To make the argument "solid" you should have a number of each kind of hives, say 50, side by side in the same apiary under the same management.

3. Quite likely swarming will be lessened if nine frames are used in a 10-frame hive and the spacing of the frames from center to center be increased. But it will not increase the size of the bees.

4. A little ingenuity will enable you to adjust together two hives of different size by tacking on strips.

Moving Bees

1. I have 20 colonies of bees that I wish to move about 175 miles some time in April or May, through a mountainous country, in a wagon. Roads are fairly good. Please give me some suggestions how to proceed.

2. Do you think a screen would be necessary over the top? UTAH

ANSWERS.—1. If your frames are not se spacing fasten them in some way so they not shake, if necessary driving a nail into ea end of the end-bars, not driving it so deep what you can easily draw it out. Put t hives on the wagon with the frames run crosswise.

2. If the entrance is large there may be need of a screen over the top. But if it only three-eighths of an inch deep, it wil much better to have the top screened. course, much depends on whether the weath is warm or cool. If a day unusually wa should come, and the bees show uneasines give them a good sprinkling of cold water.

Shipping Bees

1. I live near Wilmington, N. C. cording to "Honey Markets," issued by t government, honey sells for more by the ba rel in New York than I can get elsewhe We have New York steamers on regular r I want to sell my honey this way for this s son, provided this is the best way. After year of bitter experience I want to sell on "sure pay" or "cash with order" basis.

Do you think a New York firm would spect and pay for honey in Wilmington, C.? Can you or anyone else post me a li as to best steps to take? I don't claim to much up on business details, as I have spe about all of my time "among the bees."

2. Ha! you migratory beekeepers; h about the bee package business? Instead one man buying and another selling, why one man or firm start at a southern point ship his bees to central honey-flows, and t ship again for the flow further north, then at the end ship far south again? Ma nuclei and add shipped bees to them. NORTH CAROLINA

ANSWERS.—v. In the market quotations the bee journals are the names of firms th do business in New York and other large ma kets. Write directly to any of these, and you have what they want there ought to be great difficulty in opening negotiations wi them.

2. Shipping bees back and forth, as you sug gest, has been tried at different times wi more or less success, but the success in ge eral has not been sufficient to warrant a continuance for any length of time. The packa business is as yet on trial, but at present looks as if the difficulties are not insurmountable, and that it has a fair prospect of becoming an established business. So there seems little probability of the revival of migratory beekeeping to the detriment of the packag business.

Nucleus Without Queen

1. What do you think about using nin frames in standard 10-frame hives to give bee clustering space? Which do you recommend, ten frames or nine?

2. What do you think about taking thre frames of brood and bees without a queen t start a new colony? How and when would you do this? INDIANA

ANSWERS.—1. Likely you will do better use the ten frames. Unless you use a dum with nine, there will be too much space at th side. But it might be a gain to use the nin and increase the spacing.

2. I wouldn't think of starting with 3 bro without giving a queen or a queen-cell. If y give one of these you can start the nucle about swarming time.

Bees in Packages

1. I am thinking of getting a few hives of bees to get used to handling them. I know ba very little about bees. I am figuring on ge ting a few 2-pound packages with queen Would it be safe to put them in a new h with only full sheets of foundation in frames

2. How late in the season would it be sa for a 2-pound package in a new hive for the to get strong enough for winter? IOWA.

ANSWERS.—1. Yes; although there is some chance of their swarming out. It will be be

r if you give them a comb with at least a tle brood in it.

2. Seasons differ so much that one cannot t a definite date. The first of September ight do in some cases, and the first of July ight be too late in others. You're not likely get them any too early.

Swarming

I have 15 colonies of bees. I want to know the spring, when I cut the queen-cells out them if I could put all the capped brood in the super. Would that be a good idea, keep them from swarming.

CALIFORNIA.

ANSWER.—Yes; when you find queen-cells arted for swarming, cut them out, put all it one brood in an upper story above a queen-cluder and leave the queen with the one ood below the excluder. That ought to ave very little chance for swarming.

Old Sections

I left a lot of surplus on my hives last fall, ostly filled with comb partly filled with honey. ould you remove them in the spring and re-ace with new sections and foundation, or ave them on to be refilled with honey again?

MISSOURI.

ANSWER.—Any honey in the sections is etty sure to be candied, and a section with ndied honey in it is hardly marketable. Take the sections and sort out those containing ney, giving back the others.

Queen Rearing

1. I have my bees in the cellar; will take out early as possible and use a wire protector r the entrance, which I will remove when-er it is above 60 degrees, then replace it at on, or shortly after noon, so that no more es can get out to get chilled by evening cool ; of course, will have a bee-escape placed the entrance protector in such a way that all es that happen to be out can get back in O. , but those that are tempted to go out when is too late, can't do it. This will be my way prevent spring dwindling.

2. I have a very fine Italian golden queen om which I want to raise a few queens. I pect to commence feeding as soon as taken t of cellar. to encourage early brood-rearing; en, as soon as she has the chamber pretty ll filled, I will take out all but one frame d old queen and put it in a third story. tting empty comb in first and second stories. third story being so far from the queen y will at once start a lot of queen-cells; en, after about 8 days, as soon as they are led, will divide the second story with a ht division-board, third story likewise, and t one or two frames with a good cell on ne, in each department; then, after a few ys, or nearly time for the new queens to ch, open entrances out for each division, so drones can get out, and likewise the eens, to mate. Of course I will have queen-cluders between first and second and second d third brood-chambers. Perhaps the 4 l all mate and return to their divisions; y lose one or two, but in case I do, what is best method of introducing them into the ier hives, by cage, or can I take a frame of ood with queen and adhering bees and after ling the other old queens insert the frame h young queen? Would they accept her s way, say a day or two after the old queen s killed, and they discover that they are eenless? Or would it be best to cage the w queen and introduce as per usual instruc-ns?

OHIO.

ANSWERS.—1. As a special favor to me, I sh you would try your plan on only one ony. Then take the others out of cellar as e as possible, leaving them in cellar as long they are quiet, say until soft maples are in om, and don't do anything to keep them m flying out whenever they feel like it.

2. In your locality there is likely to be nething in the way of stores to be gathered soon as bees can fly freely, in which case ding will not hurry up brood-rearing, and it y do a lot of harm to feed when bees can fly. Neither will you find it a successful ng to try to rear queens much before the ural time when bees begin to rear them for arming. In trying to have queens reared and mated above a laying queen, be prepared to have more failures than successes, unless you do better than I have done.

Your plan of introducing a queen on a frame of her own bees is so certain of success that I wouldn't think it worth while to cage the queen. If you should want to cage the queen, I think you will find there is no danger of injuring her.

Care of Supers—Returning Bees

1. When you have taken the honey from the extracting supers in the fall, would you advise the replacing of them on the hives in order that the combs might be cleaned out by the bees, before storing them away for the winter?

2. In your oft-repeated method for the prevention of after-swarming would you kindly point out its after effects upon the parent colony (a) as to bee increase, (b) as to honey production?

3. My winter bee shed is some five rods distant from the summer stands, and when I move out the colonies in the spring many of the bees return to their winter quarters. I believe thousands are lost in this manner. Any helpful suggestions to overcome this serious difficulty will be much appreciated.

4. Have you ever known of a person being rendered unconscious for three or four hours after being stung in the neck about three of four times by bees? I should like to know, as a man here had the experience last summer.

BRITISH COLUMBIA.

ANSWERS.—1. Yes, unless you prefer to set them out in the open. In the latter case the bees are more sure to clean them out promptly and entirely.

2. As there are plenty of young bees to take care of all the brood, there should be no less increase of bees. The mother colony loses its field forces when moved, and will store less honey than if not moved. But the swarm will store more.

3. When you have removed the bees, put in the winter shed a hive containing empty combs, in which any returning bees will gather. At evening brush these in front of any hive or hives you like, and return the combs to the shed. You may have to repeat this for several days.

4. I have never known such a case personally, but have read of something of the kind. I think such cases are rare.

Rearing Queens

1. I wish to raise a few queens, and on reading "Practical Queen Rearing" by F. C. Pellett thought for my purpose and for the present would use the Miller plan; but it says it (the comb) will contain young brood with an outer margin of eggs. Now, I would suppose that outer margin of eggs would be just what the bees need to start feeding for the queens, since the younger the larva the better, but instruction says, trim away with a sharp knife all the outer margin of combs which contain eggs, except perhaps a very few next to the youngest brood. For what reason are the eggs all cut out, or perhaps only a very few left.

2. Is it a sure thing to put this comb for queen-cells in upper story with excluder between it and brood-chamber; where would you put it?

3. In using an excluder for the above purpose, is there any difference (as some claim) between a zinc and wire excluder?

4. Another thing puzzles me. In Doolittle's management of outapiaries he uses Dr. Miller's bottom-board, using the shallow depth (three-eighths deep) for summer and 2 in. depth for winter. In other words, he gives more ventilation in winter than in summer; why?

5. In Alexander's writings on Practical Bee Culture he is asked, what becomes of the drones that are in upper story when excluder is between (them) upper and lower stories? Why could not drones live in upper story as well as young bees, or must bees have egress and ingress every few days? The queen doesn't fly out every few days.

6. I will be thankful if you will state your method of having the queen-cells drawn out; your method is not stated in F. C. Pellett's book, but possibly you use one of the methods mentioned. If placing in upper story would do, with excluder, that would be the simplest plan.

FLORIDA.

ANSWERS.—1. The bees choose for queen-cells larvæ, not eggs, and that margin of eggs is only in the way. It is possible that later, after the eggs have hatched out into larvæ, the bees might use them for queen-cells, but that is not desirable. Another thing is that bees show a decided preference for rearing cells on the *margin* of a comb, and trimming away the eggs gives them the youngest larvæ on such a margin. But there's no law against your leaving the margin untrimmed, if you prefer.

2. No, I would never have queen-cells started over an excluder with a laying queen below. It's not a dead sure thing that any will be started, and if any are started the number is likely to be small. To start the cells I remove the queen from a strong colony, and about a day later put the prepared comb in the center of the hive. The comb is so much to the taste of the bees that they are not likely to start cells on the other combs, and if they do you need not use them.

3. The bees are more likely to start cells over the zinc excluder, because it shuts off communication more fully. But if you lay any kind of a cloth over the wire excluder, still leaving an inch or more at the sides for passage, you will succeed better than with the zinc in getting cells started, or continued after they are started.

4. A deep space under bottom-bars is desirable summer and winter; but in summer the bees will build comb in the deep space, so I invented the Miller reversible bottom-board. But I have not used it for many years, using the 2-inch space summer and winter, and keeping the bees from building down in summer by the use of a bottom-rack, as you will find in "Fifty Years Among the Bees."

5. I don't know enough to tell all about it; but I suppose the queen is built to stand the confinement and drones and workers are not.

6. I think this question is answered in previous answers, and you will find the whole plan very fully given in "Ffty Years Among the Bees."

Building Up in Spring

I have bees in movable frame (old style) hives. Would you please advise me of the best way to build up this spring in two hives. that is, have a double brood-nest, and have it with the maximum of bees at the beginning of alsike clover? There are thirty-two acres adjacent to my bees. It begins to bloom about the last of June here. Could I split these large brood-nests at finish of clover, supplying extra hive-body to each half and have them build up strong for the fall flow?

LOUISIANA.

ANSWER.—If you should be so fortunate as to have *all* strong colonies in spring, there is nothing better than to let them do their own building up.. If some of them are weak, you can do a good deal toward helping. Briefly, my plan is something like this: From the strong colonies draw frames of brood with adhering bees, but never leaving in any hive less than four frames of brood. Give these frames of brood and bees to colonies which have less than four frames of brood, giving first not to the weakest but to the strongest of those needing help, leaving the weakest to be helped later on.

A very strong colony divided at the finish of clover flow should build up and store in fall flow. Like enough you might get more honey not to divide; but then you would have the increase.

Spring Feeding

1. I have eight colonies of bees in 10-frame hives, packed in dry goods boxes for winter. Would I be able to secure a larger crop by feeding sugar in the spring and increasing by the Alexander plan, or holding them at eight colonies?

2. In your book "Fifty Years Among the Bees" you say you don't know whether you have the wisdom to feed properly or not.

What do you mean by that? What are the dangers of spring feeding?

ILLINOIS.

ANSWERS.—1. In your locality you will probably get a larger crop by holding them at eight colonies. If your main yield were in the fall might be otherwise.

2. If you feed on a raw day it may start the bees to flying out, and so many of them may be chilled and lost that more harm than good will follow. Just exactly when it will do more harm than good is a thing I haven't the wisdom always to tell. If the bees haven't a fair store of honey in the hive, then it is imperative to feed. But the idea that feeding will always increase brood-rearing is a delusion. In my locality—and also in yours—I very much doubt if there is ever a time in the spring when feeding will increase brood-rearing *if* the bees have already abundant stores in the hive. There are localities where early in the season there is an utter lack of stores continued for so long a time that the queen stops laying. In such case feeding is exceedingly advantageous. But in your locality there is never any very long time when at least a little cannot be had from the fields. If your bees are worth keeping you will find that in spring they have all the brood they can cover; then how can feeding help? Unless, indeed, they are short of stores, and then you must feed.

To Prevent Swarming

1. After using the "putup" plan, is it necessary to make any further effort to destroy queen-cells? About what time in the season do you cease destroying the queen-cells to prevent swarming?

2. If you were using 10-frame hives would you double the brood-chambers as with the 8-frame and then reduce before putting on the supers at the beginning of the clover flow?

3. In using 10-frame hives what objection would there be to omitting one frame to make the manipulation more easy?

INDIANA.

ANSWERS.—1. If the old queen is returned to the hive, there is always a possibility that cells may be started later on. Incidentally I may say that it is not a very uncommon thing for cells to be started immediately on the return of the queen, only to be destroyed by the bees before maturity. There is no fixed date when one can say there is no further need to look for cells. But when the flow begins to wane, or when but few cells are found in any one hive, one is pretty safe in saying that the cells are started for superseding rather than for swarming. In any case, if a young queen of the current season's rearing is given in place of the old queen, no further search is made for cells in that colony.

2. Yes, if needed; but fewer second stories would be needed with the larger hives. For, after all colonies were equalized, not so many of them would be strong enough to need a second story.

3. The objection would be that there would be fewer cells for the queen to use. To offset this would be the advantage that the use of a dummy would make it easier to take out frames. Also, that it would give opportunity to space the frames 1½ inches from center, which some good authorities think would lessen swarming.

Foulbrood

1. Would it be safe to use the brood-frames after melting American foulbrood out of them?

2. If so, what kind of treatment shall I give them?

3. Would it be necessary to treat the hive-bodies?

4. Would it be safe to use foundation after being in a hive that had American foulbrood in, but have not drawn them out? Please answer in the March number if you can

INDIANA.

ANSWERS.—1 and 2. If, in melting out the combs, the frames were kept at the boiling point for half an hour, it might be safe to use them again without further treatment; although it might be safer still if the frames were baked in an oven afterward, being heated as high as they would stand without charring the wood.

3. Many good authorities think it unnecessary.

4. It would likely be safe.

Let me add a word. If I had the disease in my own apiary I wouldn't hesitate to use all the things mentioned, only it would be a question whether it might not be cheaper to use new frames than to clean up the old ones. But if the disease were not in my apiary, and never had been, I would promptly decline the frames as a gift, and would hesitate about accepting the other things.

What Kind of Queens?

1. Do you think it would pay to buy an Italian queen for one swarm of bees?

2. Would a queen costing $1 to $1.25 be all right?

3. Would you buy a tested or untested queen?

4. What kind would you buy, three-banded golden, or leather colored?

5. Is Madison county counted a good locality for bees?

6. When would be the best time for the queen to come? IOWA.

ANSWERS.—1. Most likely. In many cases the difference in one crop of honey would more than pay for the queen, and you would have the advantage continued in future crops. But a queen you buy this year will make more difference in the crop next year than this.

2. Yes; thousands of good queens are sold at those prices.

3. Hard to say. Like enough the untested will turn out as good as the tested; but the tested ought to be a little surer to be good.

4. You'll be pretty safe on a three-banded, leather-colored.

5. I don't know, but I suppose it is. (Some parts very good.—F. C. P.)

6. June is a good time.

Ants—Roaches

Do roaches do any particular damage to a colony of bees? What is a good method of preventing damage by roaches in a hive of bees? What is the best method of preventing ants from annoying bees? ALABAMA.

ANSWER.—In the North neither ants nor cockroaches do any harm, probably, beyond annoying the bees by their presence, and their presence in the hive can be prevented simply by having no place in the hive that an ant can enter and a bee cannot. Quilts or sheets that allow ants to make their nests where the bees cannot get at them are, consequently, not so good as having covers with a bee-space between top-bars and covers; for if the bees can get into every place where the ants can, the bees can hold their own against the ants. In the South, however, there are ants that may destroy whole colonies of bees. These may be traced to their nests and destroyed by kerosene or carbon disulfide, and the hives may be set on posts with cups containing coal-tar, creosote or petroleum.

Cross Bees

I have 5 colonies of Italian bees. I bought one hive three years ago and got the rest from swarms. These bees are very cross. They are at least 500 feet from the house; had to put them there, as I used to have them 100 feet from the house, just to get acquainted with us, but had to move them, being stung so often; and now, while working in 300 feet of the hives in the field they are very bothersome, and while working on the hives they get very bad. I used to have bees for years on a city lot 25x100 feet, which never made any trouble for me or neighbors. Would you advise me to requeen the 5 colonies with a good strain of Italians this spring, or is there any other reason these bees are so cross?

NEW JERSEY.

ANSWER.—There is nothing better than requeen with a better-natured strain. But are you sure that all five colonies are equally guilty? It sometimes happens that a single colony is very cross, and unless very close observation is made it will seem that all the bees in the apiary are on the war-path. One way to do is to walk quietly in front of the hive and see whether the bees from a single colony dart out at you, or whether all do it. It is possible, however, that by introducing a good Italian queen into each colony you will gain enough in the harvest to pay more than the cost of making the change.

Smoker—Disease

1. Which is the proper place to put the fuel in a smoker? Some say in the bottom and some on top of the fuel.

2. Is the Tri-State hive as good as the dovetailed?

3. Will you please give the pronunciation of the name "Dadant?" Every beekeeper around here has his own way to pronounce it.

4. Last year there was a disease in the brood of three of my hives. As near as I could tell it was European foulbrood. I wrote Mr. Hedow about it and he said he would send me a Bulletin. I never received it. By that time I noticed it was clearing up a little. The bees were all right when winter set in. Now what I want to know is will the disease appear in the spring?

5. Was there any nectar in Spanish needle last fall? I never got a drop of honey from it nor white clover either. The honey I had came from catnip and horehound.

ILLINOIS.

ANSWERS.—1. Most smokers are made so that the grate is put in the bottom and the fuel on top of it.

2. It is much the same.

3. The Dadants came from France, and did you heard the name pronounced as it is in French I don't suppose you could repeat it to save your neck. But the whole bunch of Dadants are very much American—100 per cent and so the name has been Americanized and pronounced Day-dant, accent on both syllables.

4. It may. If it does, send to Dr. E. F. Phillips, U. S. Department of Agriculture, Washington, D. C., and he will send you a box in which you can send him a sample, and then he will tell you what the trouble is and printed information about it. This will tell you nothing.

5. I cannot tell you.

Bees on Shares

I am working 300 stands of bees, one-third started in 1918, for two years, each to get one-third of the proceeds and each to pay half of the expenses. I am to do all the work. When he took the bees we were running for comb honey. This year he has decided to run them for extracting. There is nothing said in the contract about changing. Now is it up to me to do all this work and stand half of the foundation, or is it the owner's place to do that? Hoping this won't be asking too much of you. CALIFORNIA.

ANSWER.—Working on shares is a more or less complicated thing, about which I know none too much, so I hardly dare hazard an opinion. Of course, if the change is such as to make it less profitable to you, then there should be some change in the agreement to correspond. But "in this locality" it is considered that it takes less work to produce extracted than section honey. And if you give full sheets of foundation in sections it ought to take less foundation for extracted honey. But there may be something in the case I don't understand.

Spinning Honey

Is there any method by which honey can be spun, and if so, after the process, what color does it assume, and is this peculiar color due to adulteration or simply to the process it has undergone. I have just been told that they have a process of spinning honey in the south and that after the process the honey becomes white and takes on a pliableness or

to that of lard. Is this true, or have I been misinformed? MICHIGAN.

ANSWER.—Spinning honey is something I never heard of before, and I must confess ignorance. If extracted honey is stirred occasionally as it begins to candy it helps to make it smooth and fine-grained, and what you say at the last may refer to this.

Granulation of Honey—Decoy Hives

1. I had some extracted honey last fall which I took from the bees in August, and after the weather turned cold it turned to sugar. It was pure honey; no water mixed with it, and it remained sweet. After allowing it to stand in warm water it would receive its natural color and form again. What caused it to turn to sugar? Do you suppose the honey the bees have stored in the brood-frames for winter use has turned to sugar? If so, what effect would it have on the bees?

2. The moths got after my comb honey last fall. They started their destructive work at the bottom of the sections, working upward. What is the best way of storing comb honey to keep the moths out of it?

3. One of my prime swarms that I had last summer came out in the morning and settled on a bush. It did not remain very long, and it went back into the hive. So I thought it would perhaps come out in the afternoon again. So I took a hive with full sheets of foundation in the frames and set it on a step-ladder near the place where the swarm had settled in the morning. In the afternoon the swarm came out again and settled on the cover of the hive which I had on the step-ladder and then crawled into the hive. This gave me an idea putting empty boxes with an entrance into them and a removable bottom and set them on posts and in trees and try my luck on having swarms go into them. How do you think it will work? ILLINOIS.

ANSWERS.—1. Oh, no; your honey didn't turn to sugar; it was honey still, granulated or candied honey. Under ordinary circumstances you will find your extracted honey will always granulate in the course of a few months, following a law of nature. What the bees have stored in their brood-combs usually does not granulate, and if a little of it does granulate no great harm comes from it.

2. It is easy to store section honey away from moths. Just store it in any room or box with no crack big enough for moths to crawl through. For all that you may find your sections becoming "wormy," for the moths lay eggs in the sections before the sections are taken from the hive. The most important thing to prevent this is to have Italian bees. (To kill the moths, burn brimstone under the crates of honey a few days after they have been taken from the bees.—Editor.)

3. It will work in a good many cases.

Bees Dying in Winter

I have lost four colonies so far this winter from no cause that I am able to figure out. They are being wintered outside; hives are anked up and covered with hay, front entrances open. They stood the extreme cold weather of January O. K., and since then the temperature has not been below 20 above zero. The hives are full of honey and when I opened them to look them over I found all the bees dead in clusters. The weather has been unusually warm for this time of season.

Can you tell me, through the columns of the American Bee Journal what is causing them to die, so I can save the balance? There are no moths or foulbrood. IOWA.

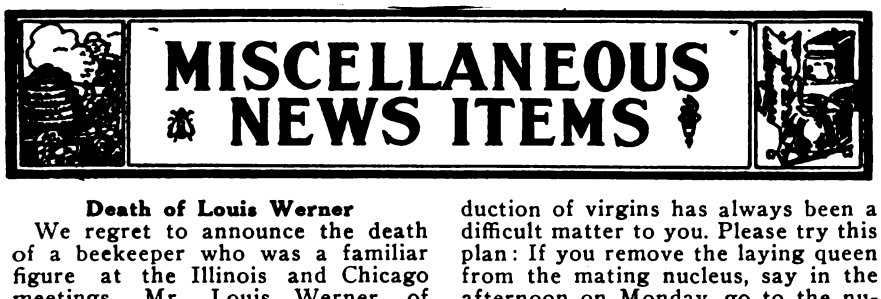
ANSWER.—I don't know, and I can't even make any decent guess what the trouble is. If it were in a very cold locality it might be that the bees were stranded on one side of the hive, all stores within reach consumed, and too cold for the bees to reach the stores in the other combs; but from what is said it cannot be cold enough for that. As a forlorn hope, one might guess poison or poisonous stores, in which case matters might be improved to take away the stores and give sugar syrup. But somehow it doesn't look like poison. Queenlessness and death from old age might be suggested, but that would hardly be so much by wholesale.

(We are all puzzled to know what is the matter. Can any reader explain the trouble?—Editor.)

Queens at Swarming Time

When a swarm comes out with the old queen and is put in a hive and when the same hive casts the second swarm, can I take out the old queen and put in the young queen with the first swarm without introduction? NEW YORK.

ANSWER.—You might do so; but you can go about to have the two swarms together and have the young queen in a different way that you might like better. When the prime swarm issues, take away the old queen and return the swarm. Then a week or so later the young queen will issue with a swarm, which you can set on the old stand and move the old hive to a new stand, and then there will be no more swarming.



Death of Louis Werner

We regret to announce the death of a beekeeper who was a familiar figure at the Illinois and Chicago meetings, Mr. Louis Werner, of Wood River, Ill. Mr. Werner had many mishaps. He suffered for years from rheumatism. On August 21, 1915, his home and apiary were invaded by a flood and he lost his honey crop and the greater part of his 75 colonies. This was mentioned in the American Bee Journal for November, 1915.

Mr. Werner was 65 years old and leaves a wife, four sons and two daughters. He died February 12. The sympathy of the Bee Journal family is extended to them.

Introducing Virgins

In the last issue of the American Bee Journal you say that the introduction of virgins has always been a difficult matter to you. Please try this plan: If you remove the laying queen from the mating nucleus, say in the afternoon on Monday, go to the nucleus again on Friday afternoon, destroy the cells, a half hour later push the cover of the nucleus hive a little to the front and let the virgin run in. I have introduced hundreds in this way and don't remember of one failure. The point which must be observed is that the bees receiving the virgin must be at least 4 days queenless. I generally give the virgins when they are less than 24 hours old. F. W. LUEBECK,

Knox, Ind.

Herkimer County Organizes

The beekeepers of Herkimer County, N. Y., gathered in the Farm Bureau office January 28. County Agent C. A. Taylor, in a few pointed introductory remarks expressed his desire to aid the beekeepers in every way possible to solve their problems.

Geo. H. Rea, of the United States Bureau of Entomology, spoke on the advantages of organization for the beekeepers. Beekeepers need county associations for the purpose of the control of bee diseases, the co-operative purchase of bee supplies and the sale of bee products. The educational and social side of such meetings should be emphasized, also. After the beekeepers had discussed their problems, such as wintering and bee diseases, they organized the Herkimer County Beekeepers' Association, and the following persons were elected to office:

President—Lewis J. Elwood, Fort Plain, N. Y.

Vice President—Geo. P. Walrath, Ilion, N. Y.

Secretary-Treasurer—C. Gardner, Herkimer, N. Y.

A campaign for membership will be carried on immediately, with the hope that every beekeeper in the county will avail himself of the opportunity to join. The following membership committee was appointed to take charge of the work: Oscar Bronner, Mohawk, N. Y.; Clyde Ransom, Little Falls, N. Y., and George P. Walrath, Ilion, N. Y.

Extension Work on the Pacific Coast

The extension work in beekeeping is rapidly coming to cover all sections of our country. In the northwest, Ward H. Foster and H. A. Schullen are doing some effective work. In these States little has been done along these lines until recently, and these men should find a fertile field for effort.

Another Texas County Organized

The Dallas County, Texas, beekeepers have recently organized, with W. E. Joor, President; John R. Hancock, Vice President, and Wm. L. Peacock, Secretary-Treasurer. With so many county organizations co-operating with the State Entomologist, the Texas beekeepers should do some effective work.

Three-Day Bee Schools in Wisconsin

Wisconsin has long been in the forefront of the beekeeping States, since it was the first to provide statewide bee inspection. The State University is undertaking some extended work in beekeeping under direction of Prof. H. F. Wilson. Two 3-day bee schools have been held, one in December and the second in February and March.

Good Short Course

From January 14 to 24 was held the annual winter course in apiculture at the Ontario Agricultural College, Guelph. The 47 men and women students represented three-fourths of the counties of the Province. The enthusiasm shown argues well for the future of the honey industry of Ontario. The course was in charge of Doctor Burton N. Gates, formerly of the Massachusetts Agricultural College, who is now Provincial Api-

arist for Ontario. He was assisted by Mr. W. A. Weir, Mr. Jas. Armstrong and Mr. F. W. L. Sladen, Dominion Apiarist, as well as by the various members of the college staff in the several departments. This was one of the largest short courses in beekeeping ever held at the institution.

GORDON DIXON, Toronto, Ont.

Tennessee and West Virginia

I had occasion to visit friends in Kentucky in January and took advantage of the opportunity to attend both the Tennessee meeting at Nashville and that of West Virginia at Charleston.

About 50 Tennessee beekeepers attended the Nashville meeting and among them one of the old war horses of beekeeping, John M. Davis, who has been known to readers of the American Bee Journal for over 45 years. I also met one of the winning lady writers on bees, Mrs. Grace Allen, of Nashville, who read a very interesting paper. Mr.G. M. Bentley, the secretary of the State organizations of Fruit Growers, Florists, Nurserymen and Beekeepers, is a live wire and turned out to be a practical apiarist, in spite of his cumulative office. Dr. J. S. Ward, the State Inspector, was abed with the influenza, but he was ably represented by his brother, Porter Ward. who was elected president.

Among those from the North, I met J. C. Allen, of Wisconsin. The Tennessee beekeepers have a growing and interesting association.

At Charleston the meeting was presided over by T. K. Massie, an old, experienced apiarist. Mr. Chas. A. Reese, the State Apiarist, exhibited some moving pictures of apiary work. The State of West Virginia appropriated $10,000 last year to promote apiary work. It was needed, for I was told that the majority of bee owners are still "bee-gum" apiarists. The gum tree, which is usually hollow, is cut down and sawed into lengths of 3 or 4 feet, with a board at each end and a few notches for entrances.

The few beekeepers who met at this convention are all practical men. Messrs. Luzader and Griffith, who live in the north Pan Handle country, gave timely descriptions of the resources of their section. Mr. Griffith is full of jokes and can keep a meeting in a roar of laughter.

For the first time I met a deaf-and-dumb apiarist, Mr. L. O. Simmons, who had a very interesting paper read by the secretary. Here, also, I heard of war cripples taking up beekeeping, and on my way home met a young soldier who lost an arm at Chateau-Thierry and wants to try beekeeping.

West Virginia, from all reports, does not have very special honey-flows. But there are lots of fruit trees, much sumach, some white clover and fall blossoms. The honey I saw was nearly all amber of good flavor.

On the whole, West Virginia appears to have a bright future for honey production, if its Legislature continues to sustain an eflort to draw the mountaineer out of the rut of log-gum beekeeping. The gums should disappear with the moonshine and give room for more modern methods.

The writer was elected an honorary member of both associations, an honor much appreciated.—C. P. Dadant.

Are Queens Reared from Grafted Larvæ Short-Lived?

After closely noting the careers of queens raised on the transference of larvæ to artificial cell cups and those raised in cells built over eggs without removal, I am strongly in favor of the latter. I have found those raised by the former method, as a rule, short-lived and inferior all around to those raised by the latter one. I have no hesitation to attribute our repeated failures to get queens through alive from America during the past fifteen years to that method. In former years, before transferring came into vogue, I could always depend upon getting 50 per cent in good condition, and often all of them.

ISAAC HOPKINS,
Epsom, Aukland, N. Z.

Group of West Virginia beekeepers—Left to right: Kelley Lance, Homer Mathewson, Will C. Griffith, T. K. Massie, C. P. Dadant, O. D. Lanham, P. L. Jones, L. O. Simmons, R. L Richardson, Grant Luzader.

Getting Rid of Ants

Beekeepers who are troubled with ordinary ants about the beehive will do well to prepare a strong solution of borax or boracic acid and water, to be mixed with some sweet, such as syrup or honey.

This, if used where the ants are found, will soon poison all of them. Care must be taken, however to put the poison in a receptacle so that the bees cannot avail themselves of it, or they too will suffer.

HENRY BEST,
Hibbetts, Ohio.

More Farm Manuals

The Lippincott series of Farm Manuals, which has been mentioned in our pages before, now numbers 12 volumes. Each volume is written by a recognized authority and the series, as a whole, forms a valuable library of agricultural information. Productive Beekeeping, by our associate editor is one of this series.

Productive Sheep Husbandry, by Prof. Walter C. Coffee, of the University of Illinois, is another valuable volume. There is no more profitable adjunct to the farm than a flock of sheep. This volume opens with an interesting account of the development of the sheep industry since early times. It also contains an extended account of the characteristics of the various breeds, the diseases to which they are subject, methods of profitable management, production of wool, feeding for market, etc. In all it contains 479 pages of indispensable information for the sheep owner.

Injurious Insects and Useful Birds is by F. L. Washburn, also of the University of Minnesota, and for many years State Entomologist. It contains several colored plates showing well-known insects and birds which add much to the volume. Most of the common insects which injure farm and garden crops are described, and may be recognized from the pictures. There are more than 400 illustrations, nearly as many as there are pages in the book.

A work of this kind is useful to every owner of a garden or larger area of cultivated land. Insects are apparently becoming more destructive as the country grows older, and a knowledge of their life history and habits will often save the owner many times the cost of such a book.

These books are all published by the J. B. Lippincott Company, of Philadelphia. The price of the Dairy and Sheep books are $1.75 each, and of the Bird and Insect book, $2. They can be had from the publishers, or from this office, for the prices named.

Group of Beekeepers at the Ithaca, New York Short Course

Death of Mr. John Thornton

We have word of the death of Mr. John Thornton, of Lima, Ill., a well-known beekeeper and fruit grower of that district. Mr. Thornton was only 58 years old at the time of his death.

A Series of Short Courses for April

A letter from Doctor Phillips conveys the information that a series of short courses for commercial beekeepers, similar to those held in California and New York, are planned for mid-western States during the month of April. The first is to be held at Purdue University, Lafayette, Ind., from April 7 to 12. The second will be held at Ames, Iowa, at the State College of Agriculture, from April 14 to 19, and the week following at University Farm, St. Paul, Minn., from April 21 to 26, a similar course will be held. The program will be similar to that followed at the California and New York courses, with Doctor Phillips and Mr. Demuth, from the U. S. Department, co-operating with officials of the various universities. Mr. Dadant, from this office, expects to attend the Indiana short course, while Mr. Pellett expects to be present at Iowa.

The Nebraska Convention

The Nebraska beekeepers met at Lincoln this year in connection with the "Organized Agriculture" meetings at the Agricultural College. The sessions were well attended and the interest very good. Prof, F. E. Millen, Iowa State Apiarist; E. G. Brown, of the Western Honey Producers', and Frank C. Pellett, of our staff, were the speakers from outside the State. H. C. Cook, of Omaha, conducted the question box. Mr. Cook is one of the best known Nebraska beekeepers and has been active in support of a bill which has been introduced in the legislature to provide a State Apiarist, similar to the Iowa officer, who shall be responsible for inspection and for educational work in beekeeping as well. The bill is reported to have failed at this session, but will probably be brought up again later, as the association is anxious to have the beekeeping work firmly established at the university.

The retiring officers are to be congratulated on the success of the first year of the new organization. Mr. Harris, the president; Mr. Olsen, vice president, and Mr. Timm, the secretary, have all been active in the new organization and have reason to be gratified with the success of the first convention. The secretary explained that he would be unable to devote as much time to the work during the coming season as has been required of him, and asked to be relieved.

Rev. R. W. Livers, of Hardy, was elected president and Prof. Myron H. Swenk, of the University, secretary. Prof. Swenk is teaching a course in beekeeping at the college and is much pleased with the interest manifested. We feel sure that Prof. Swenk will extend the work just as rapidly as circumstances will permit. A series of field meetings, to be under the joint supervision of the University and the Association, are planned for the coming summer. These will be held at different points within the State so as to be within reach of as many beekeepers as possible.

Death of Oscar Dines

We have only lately been apprised of the sudden death in the last days of December, of Oscar Dines, one of the most practical beekeepers of New York State. Mr. Dines kept nearly 300 colonies of bees in one apiary and was one of the happiest beemen we ever knew. He enjoyed nothing better than being among his bees. He died suddenly.

An Experimental Apiary for Texas

We see by the "Beekeepers Item" that a bill is now pending in Texas which provides for the establishment of experimental apiaries. This is a much to be desired end, and we hope to hear that the bill has been passed and a sufficient appropriation provided. There is much yet to be learned about bees, and many problems can only be worked out properly by State experimental stations, since the individual cannot afford the expenditure necessary to make the exhaustive tests to determine many interesting points.

Enlarging the Small Hive

When I began beekeeping three years ago my bees were in the 8-frame Langstroth hives. I soon got the tip that my hives were too small for the queens which were in them. I lifted the brood-chamber from the bottom-board and put a shallow extracting super underneath. I find this works fine; the queens filled all the frames in both compartments with brood. I find that putting the half-story under the brood-chamber is better than to put it on top. I have no trouble with queens going into the supers. The bees winter well in these one and a half story hives, outside.

E. E. EVITT, Paris, Ill.

Paste for Tin

I note on page 62 of the February Journal an enquiry for a paste to stick labels on tin. I have had difficulty with this problem and have tried honey in the paste, with indifferent success. It seems to help on some grades of tin, but is unreliable. The difficulty seems to be in a coating on the tin rather than in the paste, and if the tin is wiped with a cloth wet with muriatic acid it will clean the tin so that ordinary paste will hold.

A. GORDON DYE,
Rochester, N. Y.

UNITED STATES DEPARTMENT OF AGRICULTURE

Bureau of Markets
Shipping Point Information

San Francisco: Supplies liberal. Practically no demand or movement, buyers holding off. Cash to producers at country loading points: Extracted: per pound, water white, 18-19c, sage white 18c, light amber 17c, dark amber 14-16c. Beeswax, 36-38c. per pound.

Los Angeles: Cool, cloudy. No demand, practically no movement, no sales reported. Only few cars still in state. Beeswax: few sales. Cash to producer on farm, 38c per pound.

Chicago: No carlot arrivals. Supplies liberal. Demand light, movement limited, prices unsettled. Sales to jobbers, all sections: Extracted, per pound, white 20-24c, amber 18-26c. Comb: 24-section cases, No. 1 mostly $6.50 per case. Beeswax: Refined 45-50c, unrefined, mostly 42c per pound.

Ciicinnati: 1 California extracted arrived, no carlot arrivals of comb, nearby receipts very light. Supplies liberal. Practically no demand, no sales reported. Beeswax: Demand and movement moderate. Average yellow 40c per pound.

Cleveland: Thursday, Feb. 13—Demand slow, prices lower. Sales to bakers and confectioners: Westerns 60-lb. tins sweet clover and orange blossom, 22-26c per pound.

Denver: Approximately 4,000 lbs. extracted arrived. Receipts light. Demand and movement slow. Sales to jobbers: Extracted: white 20-22½c per pound. Beeswax: cash to producer, 38c per pound.

Kansas City: 1 Colorado and approximately 60 cases by freight arrived, 1 broken car on track. Demand and movement moderate. Sales to jobbers, Comb: Missouris, 24-section flat cases No. 1, $7.50-8.00. Colorado No. 1, $7.50. Beeswax: 35 -40c per pound.

Minneapolis: Home-grown receipts light. Supplies moderate. Demand and movement slow, little change in prices. Sales direct to retailer, Comb: 24-section cases, Minnesotas, quality and condition fair, dark color, $6-7. Colorado, fancy white, quality good, condition generally good, mostly $7.50. Extracted: Western, quality and condition generally good, 60-lb. cans, mostly 25c per pound.

New York: Arrivals: 100 barrels Mexico, 2,156 barrels West India. Exported: 2,245 cases, 127 barrels to England, 1,214 cases to Sweden. Demand and movement very slow, very few sales. Sales to jobbers, Extracted: Porto Rican, $2.20-2.30 per gallon; a few sales at $2.40. New York State, buckwheat, 18-21c per pound. Beeswax: 442 bags, 90 boxes West Indies arrived. Demand and movement moderate. Light, 42-43c; dark, 40-42c per pound.

Philadelphia: 1 Wyoming extracted arrived. Demand very slow, weak feeling. No sales reported.

Spokane: No rail arrivals. Supplies not cleared up. Demand and movement moderate. Quality and condition good. Sales direct to retailers. Strained: Idaho, water white in tins, 20-23c per pound.

St. Louis: Supplies light. Demand and movement slow. Sales to jobbers: Extracted: Southern, light amber, per pound, in barrels 19-20c, in cans 21-22c. Comb: Practically no supplies on market. Beeswax: Prime, few sales, 35c per pound.

St. Paul: Supplies liberal. Demand and movement slow. Sales direct to retailers, Colorados, quality and condition good, fancy white, 24-section cases, mostly $7.50. Extracted: Western, quality and condition generally good, mostly 25c per pound.

Export Distribution of Honey

(Compiled from data supplied by the Bureau of Foreign and Domestic Commerce.)

Country to which exported	Jan. 1-10, 1919	Total since July 1, 1918
Total		37,218 lbs.
Including Canada and New Foundland		34,074 lbs.
China		600 lbs.
Corresponding 10-day period 1918		560,808 lbs.
Total	87,860 lbs.	4,208,668 lbs.
Including Canada and New Foundland	83,887 lbs.	694,622 lbs.
United Kingdom		2,986,831 lbs.
France		492,301 lbs.
Norway	1,920 lbs.	1,920 lbs.
China	1,148 lbs.	6,375 lbs.
Corresponding 10-day period 1918		873,597 lbs.

CLASSIFIED DEPARTMENT.

Advertisements in this department will be inserted at 15 cents per line, with no discounts of any kind. Notices here cannot be less than two lines. If wanted in this department, you must say so when ordering.

BEES AND QUEENS

QUEENS—Bees by the pound, 3-banded and golden. They are hustlers, gentle to handle, cap their honey white, are very resistant to European foulbrood. Booking orders now one-fourth down, balance at shipping time. See January "ad" for prices on bees by the pound. Quote nuclei f. o. b. here, 2-frame nuclei, $4.50; 3-frame nuclei, $6; 1-frame nuclei with 1 lb. extra bees, $4.50; 1-frame nuclei with 2 lbs. extra bees, $6; 2-frame nuclei with 1 lb. extra bees, $6. No discount on nuclei. Select untested queens, $1.50 each; 25 or more, $1.35 each. Tested queens, $2.50. Select tested, $3. Free circular giving details.
Nueces County Apiaries, Calallen Texas.
E. B. Ault, Prop.

FOR SALE—Goldens and 3-bands, as good as the best. I have a limited number of tested queens for early shipping at $2 each. Untested, after May 1, $1 each. Safe delivery guaranteed if not more than 5 days in transit. No bees for sale.
H. P. Gannaway,
R. 1, Box 208, Fort Smith, Ark.

FOR SALE—For spring delivery—Colonies of Italian bees fine strain, with tested queen, in 1-story 8-frame single-wall hives, full depth, self-spaced, Hoffman frames, nearly all wired, $10 each. A few colonies in 10-frame hives, $11 each; all free from disease; f. o. b. here.
Wilmer Clarke, Earlville, Mad. Co., N. Y.

FOR SALE—Mott's Northern Bred Italian queens, untested, $1 each; 6, $5.50; 12, $10. List free. Plans "How to Introduce Queens, and Increase" 25c. Also Golden Campine eggs; best laying bird out.
E. E Mott, Glenwood, Mich.

THREE-BANDED ITALIANS ONLY—Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. H. G. Dunn,
The Willows, San Jose, Calif.

GOLDENS that are true to name. Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. Garden City Apiaries,
San Jose, Calif.

FOR SALE—Bright Italian queens, $1 each: $10 per doz. Ready April 1. Safe arrival guaranteed.
T. J. Talley, R. 4, Greenville, Ala.

BEES AND QUEENS—When you can't get them from others you can from us. 1 lb. package, $2; 2-lb. package, $3.75 Queens, $1 each, $11 per doz. Good stock; no disease; order quick. Pelican Apiary,
P. O. Box 108, New Orleans, La.

FOR SALE—Two-pound packages of bees for April and May delivery.
E. Eggeman, Allenville, Ala.

SAVE THAT QUEENLESS COLONY—Introduce a vigorous tested queen. We can supply them by return mail, $1.50 each. Three-banded Italians only. Queens are healthy and prolific, reared last fall and wintered in four-frame nuclei; no disease.
J. W. K. Shaw & Co., Loreauville, La.

Head your colonies with Simmons' Famous Italian Queens. They took first premium at New York State Fair last September. Goldens or three-bands: 1, $1.50; 6, $7.50: 25, $30. Orders booked now and filled in rotation. Also nucleus from same stock ready for June delivery. Allen R Simmons,
Fairmount Apiary, Claverack, N. Y.

J. B. BROCKWELL'S Golden Queens, untested, May, June and July, $2 each; six, $7.50; doz., $14; tested, $4 each. Breeders, $5 to $20 each; 3-f. nuclei with tested queen, $9.
Barnetts, Va.

GOLDENS—When you get tired being stung try one of these; tested, $2; untested, $1. Honeysuckle Apiaries, R. F. D. 1 Box 208,
Fort Smith, Ark.

GOLDEN ITALIAN QUEENS—No better honey gatherers anywhere at any price. Untested, $1; tested, $2.
Wallace R. Beaver, Lincoln, Ill.

FOR SALE—3-band Italian queens ready June 1. Untested, each $1; twelve, $10; 100, $80. No disease here and satisfaction guaranteed. A. E. Crandall & Son.
Berlin, Conn.

LEATHER and all dark colored Italian queens, when we have them, mated, $1 each. These queens will include all that are not up to the standard in our goldens, but will be good utility stock. C. W Phelps & Son,
No. 3 Wilcox St. Binghamton, N. Y.

SWARTS GOLDEN QUEENS produce golden bees of the highest quality; satisfaction guaranteed. Mated, $1, 6 for $5; tested, $2.
D L Swarts, Lancaster, O., Rt. 2.

WRITE ME for prices on queenless packages in quantity. E. A. Harris, Albany, Ala.

FOR SALE—3-band Italian queens from best honey-gathering strains obtainable. Untested queens, $1.25 each; 6, $6.50; 12, $11. Satisfaction guaranteed. W. T. Perdue,
Route No. 1, Fort Deposit, Ala.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you desire. They are great honey gatherers, beautiful and gentle. Virgin, $1; mated, $2. C. W. Phelps & Son,
3 Wilcox St., Binghamton, N. Y.

QUEENS FOR SALE—Quirin's hardy northern bred Italians will please you. All our yards are wintered on summer stands. Tested and breeders ready any time weather permits mailing. Untested about June 1. Orders booked now. Testimonials and price list for asking. Have been a commercial queen-breeder for more than 25 years.
H. G. Quirin, Bellevue, Ohio.

BEES BY THE POUND OR CAR LOAD—I am now able to supply you with bees and queens in any amount that you might want, having made arrangements with two southern breeders to handle all their early bees. Five other large breeders also have promised to fill my surplus orders. So before buying your bees, get my estimate. I may be able to save you money on express rates, if nothing else. Canadian trade solicited. George W. Brown,
Lynnhurst Apiary, Wilson, Wis.

OUR BRIGHT ITALIAN QUEENS will be ready for shipment after April 15. Untested, 75c each; half doz., $4.50. or $8 per doz. Select untested, 90c each; half doz., $5.50. or $10 per doz. Tested, $1.50 each. Safe arrival guaranteed.
Tillery Bros., R. 5, Box 1D, Georgiana, Ala.

QUEENS from one of Dr. Miller's breeders, tested, $1.75 each, $18 per doz; untested, $1.25 each, $13 per doz.; 1 frame nucleus, $3, 2 frames $5, 3 frames $6.50 each, without queens. We have never had any disease here. Safe arrival and satisfaction guaranteed. We have no package bees to offer, and no untested queens, except with nuclei. Delivery April 15.
Geo. A. Hummer & Sons.
Prairie Point, Miss.

AMERICAN BEE JOURNAL

VOL. LIX—NO. 5 HAMILTON, ILL., MAY, 1919 MONTHLY, $1.00 A YEAR

SOME SOUTHERN HONEY PLANTS

BY FRANK C. PELLETT
Photos by Florida Photographic Concern

THE honey plants of the north are widely distributed and the same source is important over a wide range of territory. In the south many plants which are important are restricted to a comparatively small range of territory. The following plants are all valuable in a few localities, but are not widely distributed:

Black Mangrove

The Black Mangrove, **Avicennia nitida,** is also known as blackwood or blacktree. It is an evergreen tree, growing along the seashores of the coast of Florida. It is said also to occur to some extent along the gulf coast to Texas and throughout the coasts of Tropical America. It varies from a bushy shrub to a tall tree 60 or more feet in height in tropical regions. The wood is coarse-grained, hard and very durable in contact with the soil. The tree is to be found only in the vicinity of salt water.

The honey from mangrove is light in color, mild in flavor and is generally regarded as of first quality. According to E. G. Baldwin it was the heaviest yielder of nectar known in the south, prior to the big freeze in 1895. In one year he reports Harry Mitchell, of Hawk's Park, as having secured an average of 380 pounds per colony from mangrove alone. Following the freeze it failed to yield nectar in surplus quantity for about fifteen years, and reports since that time have not indicated that it is up to its former importance.

The blooming period opens about the middle of June and usually includes the entire month of July. The flow usually lasts from six to eight weeks.

Pennyroyal

Wild Pennyroyal, **Satureja rigida,** is a square-stemmed plant of the mint family that grows abundantly on the sandy pine lands of the south half of Florida. It begins blooming in December in the southern part of its range, and blooms till early in March. Weather conditions are too uncertain during the winter months to favor storing much surplus honey. However, according to Poppleton (Review, Jan., 1893), it is the source of some surplus and from it the bees are stimulated to begin heavy brood-rearing about Christmas. In an occasional season a fair amount of surplus was secured, sometimes as much as 50 pounds per colony. The honey is said to be light in color, good flavor and heavy body—a first-class article.

Mangrove bloom.

Blooming as it does in the winter months, it is invaluable to the beekeeper whose bees have access to it. If no surplus is secured it serves to fill the hives with bees and honey at an important season and to prepare for the later crops to follow.

Gallberry

The Gallberry, in some localities better known as Inkberry, **Ilex glabra,** is usually heard of as a honey plant only in the south. However, it occurs as far north as Nova Scotia on the seashore and along the coast from Massachusetts to Virginia and Florida, and west to Louisiana. It is a common shrub in the low pine barrens of all the Gulf States. It is a small evergreen shrub with small, dark leaves. It is an important honey plant in southern Georgia, where it is widely distributed over the sandy lands, especially of the coastal plains. It grows in dense thickets and rapidly extends over newly cleared lands.

A Valuable Plant

"As a honey plant perhaps it has no equal in the southeast. We have never failed to get a surplus from it, even during the most unfavorable weather conditions. It begins to bloom the first of May and continues for 24 to 28 days. During this time bees disregard other bloom, working it up to about 8 o'clock for pollen, then the flow comes on for the remainder of the day. * * * It is a great bloomer, even the stems are rolls of bloom. * * * We have never taken off a large crop of this honey, as 147 pounds of surplus is the best crop we have ever had from one colony. The honey is a light amber color, has a heavy body. a very mild

taste, and is highly flavored. The demand for this honey is so great that we cannot furnish our local markets, consequently very little is shipped from the southeast to other markets.

"We have raised tons of this honey and have never seen a pound of the pure article, well ripened, that granulated.

"It has been said that it is impossible to overstock a good gallberry location. We do not know that this statement is true, but we have never heard of one being overstocked. We have had bees in a location where there were 362 colonies with the same result as with 100 colonies. Good gallberry locations are nearly numberless and large quantities of this fine honey are wasted every year in localities where there is not a bee to gather it. The gallberry should be included in the list of the best honey-plants."

J. J. Wilder, Cordele, Ga., Gleanings, page 1200, September, 1907.

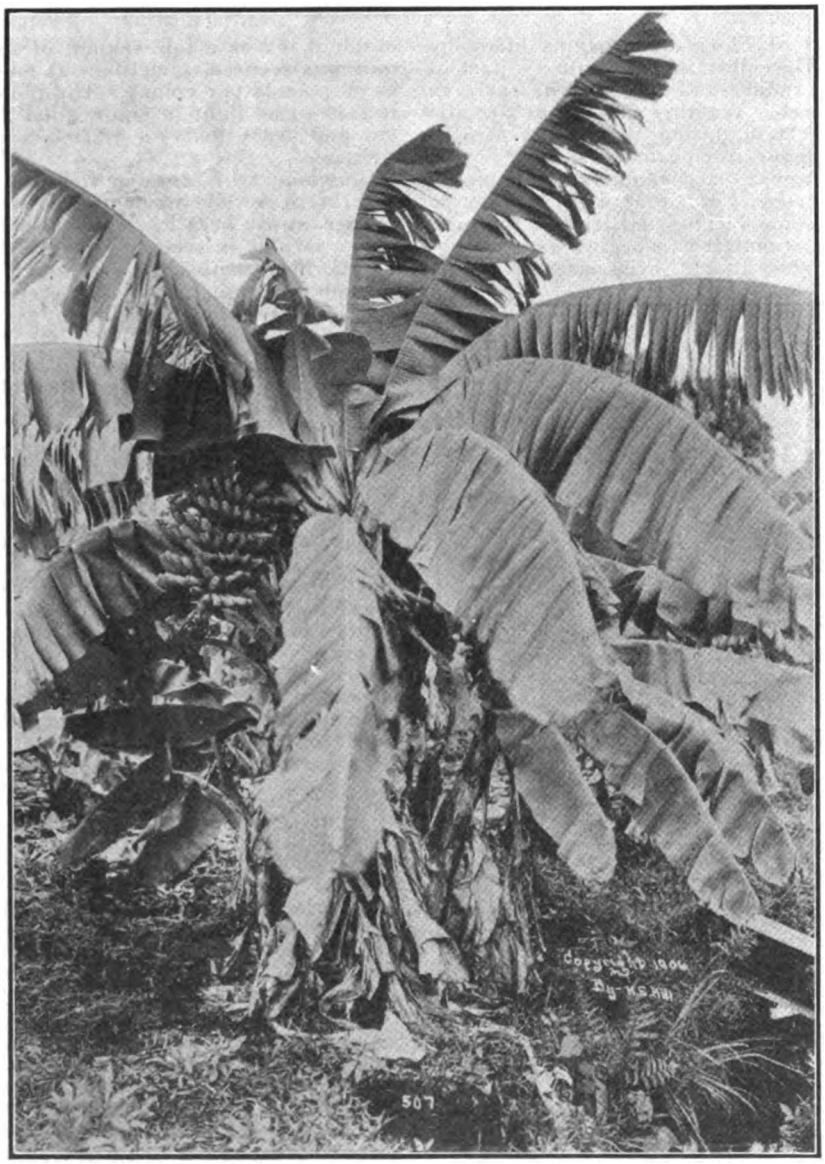
The Banana

Since the banana plant is little grown in the United States it is seldom mentioned as a honey plant, yet it secretes nectar very abundantly, and in countries where bananas are grown on a large scale it must be important to the beekeeper. We are showing herewith two illustrations, one of the plant in fruit and one showing the opening of the bloom.

The following description of the possibilities of this plant is reprinted from page 83 of The American Bee Journal for 1880, and was written by a correspondent in Clifton Springs, Florida:

"Recently noticing bees working upon blossoms I concluded to examine them. To my surprise I found that each blossom had a sack on its under side, which contained several drops of nectar of the consistency and sweetness of thin syrup. This sack gradually opens, allowing the contents to escape, unless appropriated by some insect. The blossom hangs in a position that rain cannot enter to dilute or wash out the nectar. Procuring a teaspoon I emptied into it the contents of a dozen blossoms, which filled it full. Each stalk, on good land, will produce a head having a hundred hands or divisions of blossoms, and each hand averages six blossoms, giving 600 blossoms to the stalk. Estimating 100 teaspoonfuls to the pint (88 of the one used filled a pint measure) we have 50 spoonfuls, or half a pint to the stalk. Planted in checks 8x8 feet, there will be 680 plants to the acre, yielding, according to the above estimate, 42½ gallons of nectar. But usually more than one stalk in a hill blossoms and matures fruit annually. The blossoms used were below those that produce fruit, which later, I am told, are much richer in honey.

"The first blossoms which open mature fruit. These vary in number from 25 to 100, according to quality of land, cultivation, etc. They sell here at from 1½ to 2 cents per finger or pod. Estimating fruit at 25 fingers per bunch and the bunches at 25 cents each —which, you see, is a low estimate for both, the result will be a barrel of nectar on $170 worth of fruit per acre. How does this showing compare with other cultivated plants as combined honey and money crop?"



Banana stalk in fruit.

Bloom of banana

Uniting Bees

By J. F. Diemer

IN giving the system which I use in uniting bees, I caution the beginner, or those with little experience, not to get the bees excited in looking for the queens, as this will be sure to give trouble. Efficiency is

Gallberry in bloom.

the result of experience. Reading won't give a man experience, but is of great help to all of us. There are many things that I don't know about bees, but I know a great deal of their language and how to mix them without their fighting.

It is as necessary to know how to unite bees as to know how to divide them when in need of increase. I will tell my way in as few words as possible.

In the spring of 1918, a yard of 55 colonies was reduced to 25 very strong by uniting. This yard was arranged in the "four-in-a-group" plan, two facing east and two facing west, back to back. All the queens were caught, caged and removed, each colony reduced to one story and pried loose from its bottom so as to be lifted up without jarring. The next day each pair that faced in the same direction was united, by carefully lifting one and gently setting it on top of the other brood-chamber. A queen was introduced, via the candy route, at the same time.

The extra five colonies were carried from 10 to 20 feet and their best combs divided up among the other colonies.

While carrying one of these colonies, my foot and a big rock had a head-on collision, which started a big roar in the hive. So it was set back on its own bottom till it got quiet again.

If there is any robbing going on, don't try this, for it won't work. All depends upon the bees being quiet, no excitement and no robbing. It seems to me that some people use too much smoke. I use very little at any time, and none when there is a honey flow.

One of my neighbors has a hive of bees. One day he pried the cover of the hive and jarred their nerves. Those bees went "over the top" with bayonets ready. He blew a lot of hot smoke in their eyes. They got excited and flew around, crawled out of the hive, on the ground, up his pants legs, and he got stung and got hot, and after six hours looking for the queen he gave it up and quit. The bees were still hot the next day, when I went to his place and found the queen on the first frame I lifted out.

Moral.—A nice quiet beeyard. Everybody attending to his own business. No one blowing hot smoke in anybody's eyes. This is the time to mix them up.

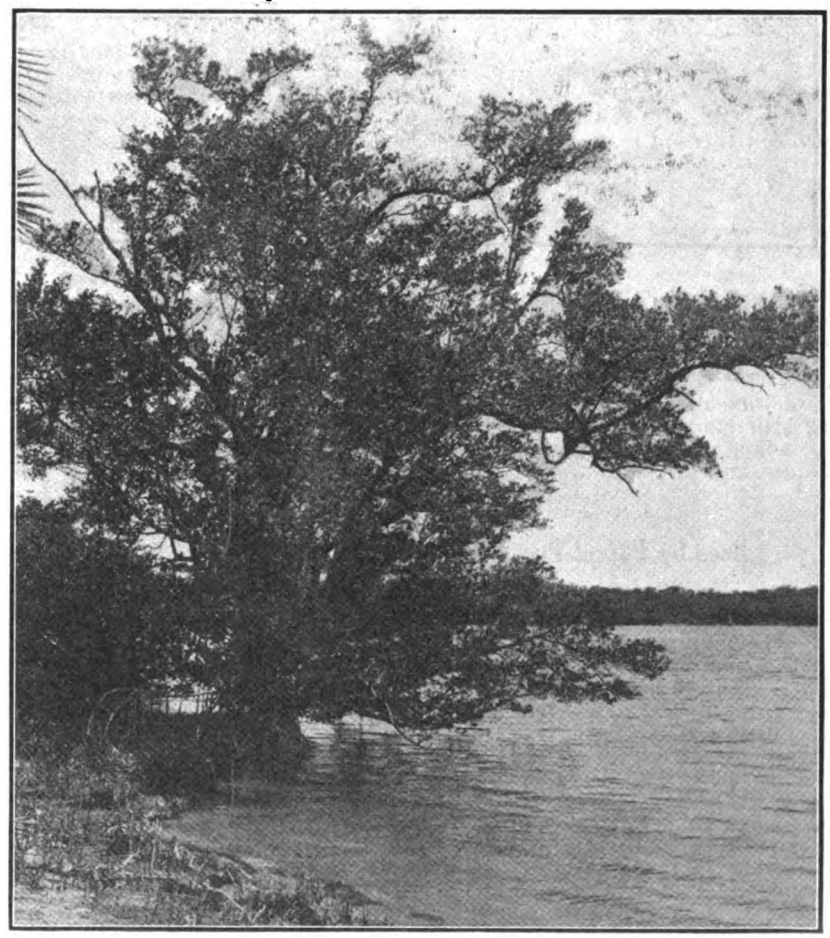
Making Big Hives From Small Ones

By W. C. Rossinck

I HAVE become very much interested in the articles in the American Bee Journal on larger hives. The great question that confronts me is, how can I get them the cheapest when supplies are so high? Last December I bought some new 10-frame (Langstroth) double-wall hives, for I am highly in favor of them, even though I winter my bees in the cellar, because the weather here in Michigan is too changeable in early spring; but since I want a larger hive, I take the frames out of the original brood-chamber and place a No. 1 super, 10-frame size, on top of this brood-chamber and use the top and bottom-bar of the Langstroth frames with new end-bars 14¼ inches long throughout, and nail these up to hang in this super, piercing six holes in each of these end-bars for wiring. Then I take 1½ sheets of foundation and lay these on the table or bench before me, just lapping the two edges about one-eighth of an inch, and run over these edges with a hot little piece of iron, melting the two into one large and nearly square sheet, and put this into the frames. This foundation then reaches within 2 inches of the bottom-bar.

This spring, when the queens commence laying in a few of the center frames in their old hives I expect to lift out these frames with bees, put on my No. 1 super and put about 7 of the 10-frames and all the bees back into this super and then scatter three of these new deep frames between them. Then, as the bees draw out this foundation, I will keep taking out the old Langstroth frames and placing the new deep frames in their place. Thus the expense is very small and I can continue using all the old supers for extracting.

Besides, I also think that this deep frame will suit the queen better than any other, owing to the fact that a queen always likes to lay in a circle,



Typical Black Mangrove tree in South Florida.

and these frames will give her a more perfect and larger circle to lay in.

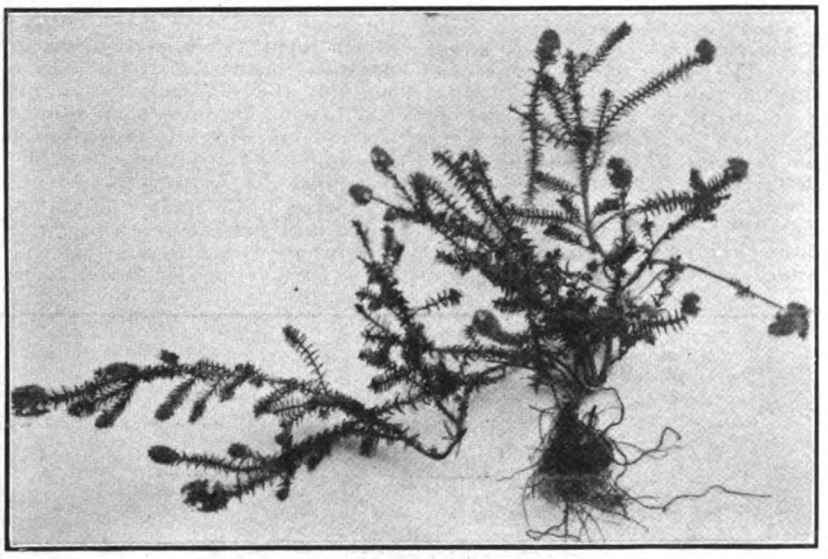
However, I am going to try it on some hives this spring, and I am not much afraid that it will not work out well, but if I make any more of these frames I shall have them cut to the right size by the manufacturer, and will order the foundation 12 inches wide. Why not have a larger hive at such a small expense?

The inside dimensions of these frames are 13¼x16¾, or 222 square inches. This makes a 10-frame hive some larger than a Dadant hive and an 8-frame hive a trifle smaller than a Dadant hive.

If any try this plan, I shall be glad to hear of their results. Criticisms invited.

Fremont, Mich.

(The only fault we can find with this economical trial of large hives is the hanging of foundation 2 inches shallower than the frames. The bees may build drone comb in that 2-inch space. It would be better to cut the foundation of the proper depth. But foundation of such depth may be more difficult to make and it may sag still more than the same goods of ordinary depth. However, these things can only be known by actual trial.—Editor.)



Wild Pennyroyal in bloom.

Bees by Parcel Post

By Allen Latham

THE pound package business has the promise of a big future, both for the man producing the bees and the purchaser as well. If, however, the future is to give all it promises, or more, it is imperative that the package of bees reach its destination in such condition of health and vitality that a vigorous nucleus can be started with the same. It is arrives with half the bees dead and the remaining half largely devitalized, the resulting nucleus will only be a source of annoyance and expense.

Some solar plexus blows have in the recent past been given to this method of building up an apiary, and more than once the count has nearly reached ten. It is the purpose of this article to make plain the cause and offer the remedy.

For many years the idea has prevailed that bees and other insects require and use up much air. Witness the innumerable instances of shutting an insect into a pasteboard box and then punching the cover full of holes lest the poor insect suffocate. In spite of the fact that many a successful bee tree has offered evidence to the contrary with its tiny knothole, the only opening to the home of the bees, the belief has prevailed that bees consume air at an enormous rate. Years back the writer became convinced that bees, while quiet use an extremely small amount of air, and on one occasion wintered a colony sealed in a packing case. I therefore make unhesitatingly this statement: Bees normally require a very small amount of air.

The former belief led to the making of shipping cases with walls of wire-cloth. This appeared logical, and if the theory had been correct would have yielded uniformly good results. Practice soon proved the contrary, or shall I say proved that something was wrong? In looking for the error we find that it is only under stress of excitement and undue activity that bees use much air. The suggestion even arises that the presence of much circulation may, on occasion, react upon the bee to cause excessive activity. Even if the exposure does not cause increased activity, it is certain to lead to the greater consumption of food. Bees must eat to keep warm. and if cool air is blown through their prison they eat excessively. Then, if not before, restlessness will come upon the bees, for much food consumption under such conditions leads inevitably to a congestion of the system that creates in the bee an inordinate desire to get out into the free air. Hence the poor bees struggle to get out of their prison, and their struggles do not end until death or the opening of the prison doors bring relief.

In an effort to counteract the resulting from the excess of expo those seeking a remedy recalled quieting effect of spraying wa upon a newly clustered swarm. it not logical to spray these imp oned bees to keep them quiet? L ical according to the immed premises, but a most atrocious clusion because of an undistrib earlier premise. Bees in a cluste swarm are one set of bees, those prisoned in a cage are a differen of bees. Like many a remedy in man ills, the relief was only t porary, and the final effect of medicine was to make the pati worse. The poor bees are wet chilled. They can get dry and wa only by licking up the water. calls for further consumption of and in a short time their restlessn is worse than ever. Added to t their intestines are full of water, soon their condition is similar to t of bees dying from dysentery in w ter. Even before the sprinkling, bodies of the bees were surchar with water from excessive food c sumption, and their jailer adds their misery by the sprinkling. I anything to wonder at, that the pa age of bees arrives at its destina with half the bees dead and the maining bees with barely life enou to crawl about in their prison?

It must be borne in mind, whene one seeks to diagnose a difficulty fecting bees, that bees and hu beings ore not in the least alike. sects and mammals are so far moved in biology that a remedy one may be a poison for the ot It is highly probable that bees sess no respiratory glands at all a to our own. That they possess high degree the ability to elimi water is perfectly obvious, but e inating water and getting rid o are two different things. Only ways are open to the bee, one is respiration and the other by ex sion of the bowels. The first achieved only by excessive acti and heat production, the other o in a cleansing flight. The imprison bees cannot adequately use either these methods, and must suffer a die. If we are to find a remedy an evil affecting our bees let us f of all cease to have any idea bees and human beings funct alike.

It will be seen from what has already been written that success the shipment of bees by packa must lie in the conservation of b energy, not in its waste. In ev possible way we must keep the be quiet. How, then, can we keep bees quiet?

In answering the question just I would follow the same channel thought that has led to the solut of so many other bee problems. Dr. Miller would say, take it to bees. So I will ask another questi Under what conditions do bees k quiet? Is not the answer, W darkness and health are both pr ent?

Miss Brown, after work is done.

Acting upon this mental deduction I set out a few years back to devise a shipping-case for the bees in which darkness was the first consideration. For two seasons this case has been in use by me, and its use has been attended by phenomenal results. Such statements in the letters from my customers as follow are not uncommon: "There was not a dead bee;" There were not to exceed 25 dead bees in the entire ten packages;" "The bees were so quiet that I thought they were dead until I opened up the package." This cage or shipping-case is under process of patenting and will soon be put upon the market. In a later article the case will be described, accompanied by photographs of the same. For the present I will merely say that the case is made of wooden walls instead of wire-cloth. The bees can get air as they desire it, but no currents of air strike them, and **no light.** Ninety-nine per cent of the bees remain quietly clustered, a few only are always seeking an exit to the outside world. During the trip small patches of comb are built and the queen is usually laying in the same.

The number of bees seeking an exit depends very largely upon how the bees are put up. If only young bees are caged, very few bees are restless during the journey. Old bees should never be put in with the others. The writer has every confidence in this shipping-case, and predicts a prosperous future for the pound package. With this case in use one can rest assured that the packages of bees will arrive in perfect shape, barring accident. Accidents we cannot control, but with this cage we need only to be certain that proper food and proper bees go into the case in order to feel assured that the buyer will be pleased with the goods upon their arrival.

Norwich, Conn.

A Lady Expert With Bees

I have just returned from a trip to one of the other islands, where Miss Mae Brown (who has complete charge of our queen breeding and requeening operations) was in the act of requeening 2273 colonies of bees. I stayed with her watching the process for nearly five weeks.

In five days after she arrived at the apiaries she had put queen-cells into seventy-one colonies of bees. The queens had previously been removed from these seventy-one colonies, and they accepted 941 buds of the lot that she put in. To take care of these 941 queen buds on the 9th day, or before the young queens emerged, required a great deal of work in searching out and killing old queens, etc. However, she began this work two days earlier with her usual staff of four Japanese men, and it was a real pleasure watching them work. Through the whole process they were striving to outdo each other in finding queens, while Miss Brown kept her note book and scissors on hand. The note book contained data on each of the old queens and it was necessary to make some new entries for future use, while the scissors were used for clipping the wing of any queen that should need it. In this way she was able to examine an average of 350 queens per day, as well as introduce the buds as they came along on the ninth day. In the meantime extra buds had been put into these first mentioned 71 colonies, as she required several hundred additional cells to complete the work. She generally kills 50 per cent of the old queens so that all are requeened every two years.

Most of these young queens were laying when I left the work. As she was searching for these young queens to examine their condition and clip their wings before closing up the lower box, or brood-nest for the year, I had the pleasure of seeing as fine a lot of young Golden Italian queens as it is the lot of man to see.

Just before leaving for home I had Miss Mae Brown stand with her four Japanese men while I took a snap shot of them. Inclosed you will find a copy of the same.

E. C. SMITH,
Honolulu, T. H.

(Queen buds is a term used in Hawaii for queen-cells.—Ed.)

Bees to Japan

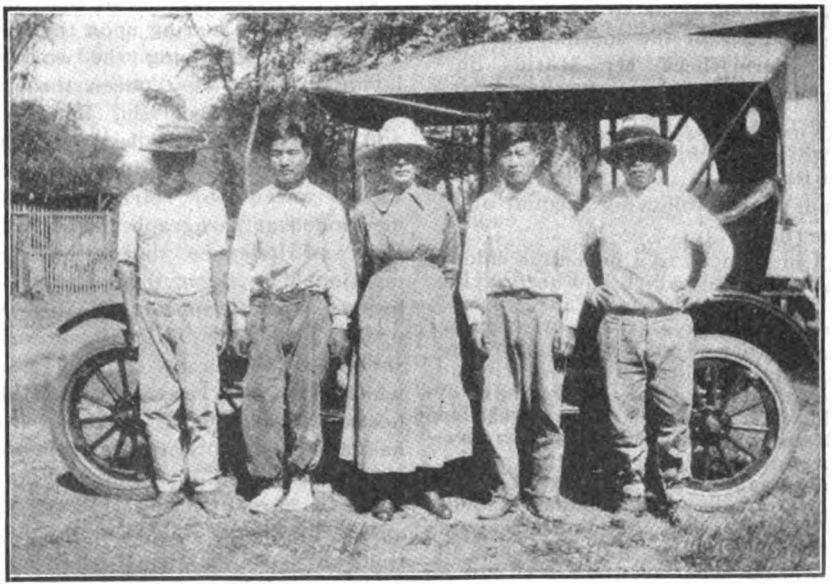
1. Can I take a few Italian queen bees to Japan in May? It takes 17 days for the voyage.

2. Will you tell me how I should pack them? R. H. W.

Los Angeles, Calif.

Answer.—The dealers in bees and supplies sell "long-distance mailing cages" at 10 cents each. These are provisioned with candy for the trip. Put a queen in each and place with her a fair number of bees, enough to occupy the cage without crowding. The bees to take for that purpose are bees that are active field workers, but not too old. Old bees are recognized by their shiny looks. The young bees have more hairs and look fuller. Take them as they come home from the field and you will be sure not to make a mistake. But if you are acquainted with bees, you may take them from the inside of the hive. You should make sure that you do not take young bees that have never yet had a flight.

For the transportation, keep them in a place where they will have warm air, not below 65 degrees; no light, no disturbance. Do not handle them any more than you can help, and when you reach your destination introduce them to colonies as early as possible. We have kept bees a month in this way, with very little loss. If the candy is so dry that they cut out particles of it and it falls out of the cage, moisten the cage slightly with your finger wet with water. Otherwise do not give them any water; they do not need it, when their food is of the proper consistency. Water is needed only for brood-rearing.—C. P. D.



Miss Brown and four Japanese assistants

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language. Consolidated with The National Bee Journal in 1874.

Published monthly at Hamilton, Illinois.

Entered as second-class matter at the postoffice at Hamilton, Illinois.

SUBSCRIPTION RATES—In the United States and Mexico, $1 per year; three years, $2.50; five years, $4. Canadian postage 15 cents, and other foreign countries 25 cents extra, per year.

All subscriptions are stopped at expiration. Date of expiration is printed on wrapper label.

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THE EDITOR'S VIEWPOINT

Bees as Trophies of War

The "Revue Francaise d'Apiculture," of Marseille, is authority for the statement that the Military Administration of Germany offered for sale a large number of colonies of bees **taken** from the invaded countries. A man of the name of Herter, of Heilbronn, Wurtemberg, stated that the Wurtemberg Beekeepers' Association had thus secured 300 colonies at the prices of 28 marks for skeps and 54 marks for movable-frame hives. This Mr. Herter had secured two colonies, one of which perished in the trip, but the other one was for him a "dear souvenir of the war."

We trust the Beekeepers' Association will be able to deny this statement.

Refrigerated Queen Losing Her Fertility and Regaining it

Concerning the possibility of chilling a queen so as to partly destroy the fertility of the spermatozoids in her spermatheca, Mr. Marius Barthelemy, the capable director of the Experimental Apiary of the French "Societe d' Apiculture des Bouches-Du-Rhone" at Marseille, France, sends us the following account of an experiment:

"I introduced to a queenless colony a young queen which had been laying normally in a nucleus of three combs for several days. The introduction was performed at 1:30 p. m., by dipping her in a little honey which had been diluted with a tablespoonful of cold water. The operation succeeded fully and the queen spread her laying rapidly. But after three weeks, while examining the colony, I found upon 7 combs a tremendous amount of drone-brood, extending to about nine-tenths of the total. This was all in worker-cells, as there was not a single drone-cell in those combs. Having allowed the queen to remain, in order to exhibit this peculiar case to my colleagues, I later noticed a decrease in the amount of drone-brood and a corresponding increase in the number of cells occupied with worker-brood, especially at the upper edge of the combs. I removed the queen and placed her in a nucleus where her laying gradually returned to normal conditions. The introduction of a normal queen in the drone-brood colony soon brought things back to ordinary conditions.

What do you think of this abnormal drone-laying in a healthy queen? Is it not probably due to the refrigeration which the queen suffered when I dipped her into cold sweetened water? It seems to me that this is well proven by the fact that the bees of the nucleus from which she was originally taken managed to rear another good queen from the brood that she had left behind and which also produced healthy workers. I am glad to call this to your attention, as it is the first case of this kind that I have ever witnessed."

"Marius Barthelemy."

This is interesting and of some importance in its bearing upon the possibility of destroying the worker-laying capacity of a queen through cold. Messrs. Dzierzon, Berlepsch and Mahan had also destroyed the life of spermatozoids in the sperm sac of queens, by refrigeration, as mentioned at paragraph 151 of "The Hive and Honeybee"; but in the cases mentioned by them, the queens had become to all appearances permanently injured. The above case shows a temporary injury, from which the queen recovered, probably because the action of the cold water had not been as thorough as in the cases mentioned by these experimenters. Let us avoid chilling our queens by dipping them in cold solutions or exposing them to low temperatures.—Editor.

Warning to Italian Beekeepers

In "L'Apicoltura Italiana" for February, the noted queen breeder of Bologna, E. Penna, warns the Italian beekeepers against any importation of bees from beyond the Alps into the peninsula of Italy, since the Italian race of bees is prized everywhere, and its purity is of great value.

We believe that the beekeepers of the entire world will join him in this warning. Although some other races have proven good, such as the Carniolan and the Caucasian, the Italian bees are the only race, of gentle disposition and great activity, whose purity may be easily ascertained in the color of the bees. A slight mixture of the common black bee will show itself immediately in the progeny, while a slight mixture of the black bee in the Carniolan or the Caucasian gray bee will go unnoticed.

Mr. Penna lays great stress upon the value of the Italian bees as better able to withstand the Isle-of-Wight disease and the bacillus pluton (also called European foulbrood and bacillus alvei, Cheshire) than any other race known. In this country we know but little about the Isle-of-Wight disease, but it is well-known that the introduction of young Italian queens in colonies suffering of European foulbrood has often, if not always, helped to cure the colony.

Porto Rico Beekeeping

The industry of beekeeping, which was reported as in its infancy in Porto Rico in 1911, by circular No. 13 of the Porto Rico Agricultural Experiment Station, is progressing fast. Mr. Elton Warner, who has spent most of his life in Mexico and Porto Rico, gave up a very lucrative position in the U. S. Government employ, in the island, in order to take up beekeeping. Mr. Warner now has some 1,500 colonies in Porto Rico, as well as some 500 in North Carolina. The writer met him at Ithaca and found him full of enthusiasm, for after a few years of trial, Mr. Warner knows that an independent life is sure to be the reward of the progressive beekeeper.

The Revived Belgians

Many among our readers have had occasion to feel the pangs of anxiety and incertitude over the fate of some of their friends or relatives in the terrible conflict which is hardly yet closed. We had a feeling akin to this incertitude concerning our Belgian

beekeeper friends. The editor of the "Rucher Belge," a publication of 25 years standing and one of the most advanced in Europe, disappeared in the abyss of the German invasion at the very beginning of the war. His home and the Association which his magazine represented, the "Society of Apiculture of the Basin of the Meuse," were at the very spot of the opening of hostilities, in the vicinity of Liege, where the atrocities of the invaders were most marked.

Letters to them brought back no replies, and we thought them dead. Imagine our pleasure in receiving the following a few days ago, from this same editor, Mr. A. Wathelet:

Prayon-Trooz, Jan. 2, 1919.

Dear Mr. Dadant: We are at last freed of the bandits. In April, 1915, I received your excellent letter of August, 1914. The sentiments which you expressed in this letter gave us the hope that the noble Republic of the United States would do what she actually did—save us from starvation and deliver us, as well as the rest of Europe, from the Huns.

I cannot clearly express the gratitude which we feel towards the United States for this. It is also impossible to describe our sufferings during those 4 years.

My family is in good health. Two of my three sons served in the army and are also safe, as well as my nephews. We are now better nourished, we have bread in sufficiency and are no longer compelled to eat turnips, beets and rutabagas. But clothing, footwear, etc., are still at unapproachable prices. Let us hope that within a few months everything will become normal.

None of our bee magazines have appeared during the war. Even now print paper is scarce and out of reach. We do not know when we may again begin the publication of the "Rucher Belge" (Belgian Apiary.)

If you can spare me the missing numbers of the American Bee Journal, you will please me greatly, for I have received none since August, 1914.

You should be proud, dear Mr. Dadant, of your native country, as well as of your adopted country. You cannot have an adequate idea of the enthusiasm with which the Allies are welcomed here, as they pass through to occupy the country of our invaders.

Accept my best wishes for you and all your people.

A. WATHELET.

Does the Jellow Jasmine Poison Bees?

On page 500 of the American Bee Journal for November, 1879, Mr. J. H. Brown, of Augusta, Ga., makes the following report:

"In some sections of the South, particularly on light, sandy soils, there may be found some Yellow Jasmine (**gelseminum sempervirens**). As its flowers possess very decided toxical properties, it is not a very desirable plant to have within the range of bees. It blooms after the alder. While our native black bees are very seldom seen working upon it, the Italians, in some seasons, will work upon it quite briskly. I am inclined to think, from close observation, that it is mostly pollen they gather from it, though in some seasons it does yield some honey.

"I have more particularly named this plant because of its poisonous effects upon young Italian bees immediately after taking their first meal. For the past nine years I have observed, commencing with the opening of the Yellow Jasmine flowers, a very fatal disease attacking the young bees and continuing until the cessation of the bloom. The malady would then cease as quickly as it came. The symptoms of the poisoning are: the abdomen becomes very much distended, and the bee acts as though intoxicated. There is great loss of muscular power. The bee, unless too far gone, slowly crawls out of the hive and very soon expires. When examined, the abdomen seems to be distended with a sort of serous looking fluid. The deaths in twenty-four hours, in strong stocks with much hatching brood, may amount to one-half pint, often much more.

We are much interested in knowing whether the nectar gathered from this plant is really the cause of this disorder. We wrote to Mr. T. W. Livingston, of Norman Park, Ga., and asked his opinion. His reply follows:

"I have for many years noticed the bee disease described, and was out among the bees yesterday where there was much Yellow Jasmine in bloom. I saw a very few bees working on the bloom, more bumblebees than honeybees, and saw several colonies affected slightly with the disease peculiar to this time of the year. In some cases the bees do not swell up and in others they do. Some have a trembling motion, and others are stupid and can scarcely move. I have seen the same disease where there was no Yellow Jasmine that I know of, but much more of it where that plant was plentiful. It may be caused by it. I was told several years ago by the Florida State Chemist, who had analyzed a sample of honey that had poisoned some people, that the honey contained pollen from the Yellow Jasmine, in which he found the poison that had done the damage."

We would be very glad if readers living where this plant is common, would write us whether they have made similar observations. We are anxious to secure some further information regarding the possible poisonous properties of the Yellow Jasmine to the bees.

Texas to Experiment

We are much pleased to announce to our readers that the Texas Legislature has made a liberal appropriation for the establishment of experimental apiaries, under the direction of Prof. F. B. Paddock, State Entomologist, of College Station. A trained man will be placed in charge, and extended work will be undertaken looking toward the solving of the special problems of beekeeping in the Lone Star State. Beekeeping is very highly specialized in Texas, and we look for some most excellent results to come from this experimental work. We would like to see experimental apiaries in charge of capable men established in every State where beekeeping is an important industry, and hope that the time will not be long until such a result is achieved.

Honey Prices

Just now, when the market prices for all commodities are rapidly falling, it is well for the beekeeper to bear in mind the importance of developing the home market to the limit of its capacity. During recent months, because of the restrictions of the food administration on the sugar supply, many new uses have been found for honey, and many people have become accustomed to its use who have not previously been in the habit of buying this particular product. The removing of the restrictions of the food administration, again places honey in direct competition with sugar and other sweet products. It will be necessary for beekeepers to resort to active measures to advertise honey, and stimulate its use in every possible way, if good prices are to continue.

If every beekeeper will cultivate the home market to the limit of his ability, prices will be stabilized. War time prices cannot be expected to continue, neither should prices drop to the low levels of recent years.

You Can if You Will

By F. Eric Millen

OF all the beekeepers in this country there are relatively few who are securing a maximum crop of honey each year. In some cases ignorance is the cause, in other cases neglect, and the majority of beekeepers would probably have to be classed with the neglectful, because ignorance is, usually, the twin brother of neglect. There are no excuses for any of us keeping bees these days unless we have the requisite knowledge with which to run them profitably. Beekeepers can secure, without cost, sufficient information from Government and State Bulletins which will enable them to learn the fundamentals of beekeeping practice. However, we usually find those beekeepers who are interested sufficiently to secure beekeeping bulletins also realize that a few dollars invested in other good beekeeping literature is a good investment.

Why is it that we do not produce larger crops of honey? I believe the answer is that we lack the interest and have too little ambition. Why do we lack interest and ambition? Because in so many cases our Creator and nature have been and are too kind to us. With little effort we can secure enough of this world's goods to live and we remain satisfied. Often it takes some serious happening to bring out the best part of our make-up.

In 1911 Mr. Harvey E. Nicholls, the subject of this article, an Iowa beekeeper, had the misfortune to lose both legs in a boiler explosion. Figure 1 shows us that our friend has lost the right leg near the thigh, but has the use of the left knee joint. This accident happened when Mr. Nicholls was 21 years of age, and many of us would probably have given up the fight and have been content to live on charity. Not so, however, in this case; the loss of his legs gave him the impetus necessary to make life successful, and while before the accident Mr. Nicholls' ambitions were small, he soon realized that life was ahead and that he had to make good.

A legless man who is a successful beekeeper.

A legless beekeeper who drives an automobile

In 1915 he secured a swarm of bees and, although he secured no honey that year, the bees were carefully prepared and packed outside for winter. Early in the 1916 season a good book on beekeeping was purchased and this book was studied in conjunction with the manipulation of the colony. Frequent visits were also made to successful commercial beekeepers living in the vicinity, and much information was freely given from this source.

At the close of the season Mr. Nicholls had 80 pounds of honey surplus and had wisely refrained from making increase. Slow but sure. The single colony was again packed and wintered well. Nineteen seventeen opened and three more colonies were purchased and transferred from their old hives into standard 10-frame hives. Two 2-pound packages of bees were secured from the south and two other colonies were worked on half shares. During the season Mr. Nicholls worked for the Western Honey Producers, assembling beekeeping supplies and worked with the bees at odd times. The close of that season found our friend with twelve colonies and a crop of 400 pounds of honey. The twelve colonies were wintered successfully.

The twelve colonies, together with two more purchased, were moved five miles from town in the spring of 1918. Besides the aforementioned fourteen colonies, forty-five more were worked on shares, for half of the surplus honey only. Work at the supply factory was discontinued, except at odd times, and the bees received the required attention. A second-hand Ford was purchased, on time, and the apiary and town made easily accessible.

The fourteen colonies were increased to twenty, and the forty-five on shares increased to eighty-five, this being a part of the agreement when the bees were taken in hand. A man was hired for six days, during the season, to help lift the heavy supers into the Ford and assist with other work in the apiary.

From May 1 to September 9, 1918 the returns from the bees, together with the odd work amounted to just over $800. Just look at Fig. 1 again and then one can imagine under what apparent difficulties Mr. Nicholls worked. I say apparent, because our friend did not stop to say "I can't," or "impossible," but went ahead and made the undertaking a success. You can if you will.

Figure 2 shows how it is possible for Mr. Nicholls to move around from place to place as he so desires. An artificial leg fitted to his left limb enables him to drive his Ford just as easily and surely as any of us with two sound legs, and distance is no object to our friend.

Mr. Nicholls has not only made a good start to become a successful beekeeper, but at the age of 29 he is putting himself through high school another very creditable feature. Although just making a start in life our friend believes in tithing and gives 10 per cent of his earnings to charitable purposes, besides this last summer a sister and grandmother were partially supported.

When I secured this brief history I realized that some of our soldier boys home from the war, who might be partially disabled, may be interested in knowing what Mr. Nicholls has accomplished. We cannot all be beekeepers, but we can be useful citizens. To those of us who are beekeepers this article should certainly awaken the desire to succeed, and you can if you will.

Iowa State College, Ames, Ia.

Robbing

By C. P. Dadant

"They were in truth great rascals, and belonged to that class of people who find things before they are lost."—Grimm.

NO, bees are not great rascals although they sometimes "find things before they are lost." But this is due to their great industry.

There is hardly a text-book published on beekeeping, at the present day, that does not have a chapter upon robbing and how to prevent it

Nevertheless, the editor of a bee periodical often receives enquiries like the following, which is typical of the beginner:

"I have a neighbor who has a larger number of colonies than I have and his bees rob mine. What shall I do to prevent it? I tried moving the robbed colony to a new spot, but it does not seem to help matters."

We have known novices to become angry at their more successful neighbors because their bees were being robbed apparently by a joint action of more powerful colonies. Yet, as in the destruction of colonies by the moths, the fault is with the owner of the robbed bees. Here again, we have to repeat Oettl's Golden Rule: "Keep your colonies strong."

A weak colony is not necessarily in danger of robbing, if the number of combs which the bees have to guard is in proportion to the size of the swarm. If we have small colonies, made by the building up of nuclei, or the hiving of late swarms, we can protect them, or help them to protect themselves, by reducing the number of combs in proportion with the size of the colony and using a dummy to reduce the space.

It is good policy to strengthen such colonies, as early as convenient, with brood and bees from more powerful ones.

Let us say to the beginner, once for all, that it is a mistake to believe that the different colonies of a large apiary will unite to rob those of a smaller one. But after a colony of bees has lost its courage and has given up defending its stores, the bees of any other colony in the vicinity may join the robbers.

It is very important to avoid robbing, not only by reducing the combs of a weak colony to such space as they can easily defend, but also by having each colony supplied with a good queen. The entrances should not be too large, but only of such size as will readily accommodate the passage in and out of the workers.

Above all things, no honey or sweets should be exposed where they may entice bees to rob, in time of scarcity. Accidentally, a door may remain open in the bee house, or a case of honey may be forgotten where the bees have access to it. As soon as they find the desired sweet, unprotected, they set to work to remove it to the only safe place they know—their hive. The arrival of loaded bees, to the hive, is at once noticed; whether they have means of telling each other, or whether the odor of the plunder is sufficient. We incline to the first surmise. Bees can tell each other many things, as do the scouts of the swarm who have hunted for a new home. The alarm is soon given to the entire colony and the air becomes filled with hunting workers who are looking for the treasure. Any practical beekeeper can tell, at a glance, when his bees are finding unexpected wealth, as they fly about and hunt in every nook and corner where the least odor attracts them.

Can we blame them for this? It is their nature to carry home everything which is undefended. After a little practice, even defended stores will draw them. Do they find that stolen sweets, like stolen kisses, are always sweeter? No, for when there is honey in the fields they are not attracted by stored sweets, and seem to prefer the nectar of the blossoms to anything else. Only the inveterate, shiny, aged robbers, who have carried on the practice for a number of days, will hesitate between nectar and strong-smelling honey in the combs.

How to prevent robbing? Never by removing the robbed colony to a new spot. It goes without saying that, when you remove a colony to a new spot, you lose its field bees. But you do not lose the robbers, who are here, there and everywhere, ready to enter any crack that will give them a passage. If the robbed colony is worth saving, a very good way is to exchange its location for that of the robbing colony, provided both belong to the same apiary. The robbing colony may be found easily by sprinkling a little flour over the robbers as they emerge from the robbed hive. The behavior of the robbers when their home is suddenly placed in the spot of plunder, is ludicrous. They are entirely routed, and when they go back to the old home spot, where they find the robbed colony, they defend it with as much alacrity as they employed in robbing it.

If the robbers do not belong to the owner of the robbed bees, the safest way is to close the robbed colony and remove it to the cellar, putting an empty hive in its place. The empty hive will serve the purpose of amusing the robbers who waste their time hunting through it. Otherwise, they would perhaps try to rob the next colony, especially if they are in great force.

It is a mistake to handle bees and open hives when robbers are about in any number. If you **must** do it, then reduce the entrance to a very small space, close the hive as soon as possible and throw fine grass loosely over the entrance. A bunch of grass, through which the bees of the hive must crawl to reach the open air, is soon filled with guards and any robber that comes near, in the hurried, guilty way so common to them, is soon apprehended and taught a lesson. This will do very well, where robbing has just begun.

If a colony is carried to the cellar to stop robbing, it is important not to have any robber bees in it, for as soon as it is returned to its stand those bees will begin their pillage again. So every robber ought to be liberated before the hive is removed. If it is not very strong in bees, a few young bees from a colony of pure Italian bees may be given it a day or so before it is brought back to the light again. These young bees, who have not been demoralized by the robbers, will usually act as guards when the hive is brought out again, and will do short work with the robbers, unless the latter present themselver in great numbers.

Take notice, that Italian bees usually defend themselves very much better against robbers than either black or hybrids. Being less excitable, they run about less, and watch more. That quality alone would make Italians worth while.

Is it necessary to call the attention of the novice to the similarity of action between the robber bees and the young bees who are taking their first flight out of their home? In both cases they fly about to reconnoiter or recognize the spot. A pious old monk of the past century, the Reverend Babaz, called this "making the sign of the cross" in front of the hive. in the case of robber bees, this action might have been likened to that of the Calabrian brigands, who, before the liberation of Italy, some 75 years ago, used to make the sign of the cross to protect themselves against the possible defensive action of the travelers whom they ransomed. The robber bees are heavy with honey, as they fly out of the plundered hive, while the young bees taking their first flight are not loaded, and disport themselves with good grace and peace.

A great incentive to robbing is found in disjointed hives. When top stories and covers have been pried open many times for apiary operation, they finally gape at the corners. This attracts idle bees in times of scarcity. A little clay mixed with water closes such gaps effectively for the time. Personally, we use telescoping covers to avoid this annoyance.

"An ounce of prevention is worth a ton of cure."

About Inspection

By Charles D. Blaker

I HAVE read with a great deal of interest the article entitled "Force of Education," appearing in the February issue of the American Bee Journal. I do not think that anyone will feel disposed to disagree with Mr. Pellett concerning the importance of the educational side of the work of the inspector of apiaries. And perhaps in some cases the inspector has been given more power than is altogether wise, but when he proposes to "make the office a purely educational one" I must dissent. I maintain that education, as important as it is, is not sufficient. Speaking of hog cholera in comparison with foulbrood he says, "that the owner's financial interest in the hogs should be sufficient to give the matter his attention." However true that may be in the case of hog raisers we know that very often it is not true in the case of beekeepers. For instance how often we find a man with one or more colonies who is too busy with other matters to give his bees pr per attention, and who would not clean up unless there was a law having teeth in it that compels him to do so. Within a mile of him there may be a beekeeper who has hundreds of colonies of bees. Should we not have a law that would protect the financial interests of a man who has invested hundreds of dollars in bees?

If the inspector is not to be "the sole judge as to whether or not disease is present" pray tell who is to be the judge? Who is the judge in the case of glanders in horses or tuberculosis in cattle if not the officers designated by the law? To say that "under such a law healthy colonies of bees may be destroyed with no protection for the beekeeper," is no more true than to say that healthy horses and cattle may be destroyed with no protection for the owners under the laws now prevailing for the control and suppression of diseases among horses and cattle.

The comparison of the apiary inspector to a policeman who "is only called when you have committed a crime or are suspected of malicious intent" is, I think, an unfortunate one. Also it implies that the rank and file of beekeepers are a rather ignorant lot of people. My experience leads me to believe that not one person out of a hundred holds any such view of the inspector when he appears at his place, and if the man is possessed of a little ordinary common sense he understands the situation when it is explained to him by the inspector. During the four years of my experience as inspector we have met with serious objection from less than one half of one per cent of the owners of all the apiaries examined in the State during that time, and only one of these objectors could be classed as among those who look upon the inspector as a "policeman," and this poor fellow was mentally deranged, having formerly been for a little while an inmate of an insane asylum.

Surely every one will agree with Mr. Pellett when he says, "What does it profit to burn up one man's bees and leave a similar condition across the fence untouched?" But the remedy for such a condition is to change the inspector, not the law. The question touches only on the incompetency of the inspector and has absolutely nothing to do as to what the law in the case should be. All officers are expected to perform their duty, but in case one fails we do not immediately begin to agitate to have all authority taken away from the office.

I am not inclined to disagree with what Mr. Pellett says in opposition to a quarantine law if he means a "quarantine against the sale of honey from infected **areas.**" But Minnesota has a law that quarantines an infected **apiary** so that the owner can not "sell, barter or give away or remove to another location without the consent of the inspector any bees, honey or appurtenances from an apiary known to be infected with contagious disease, etc. My deputies have instructions to always give consent to the sale of the honey after notifying the owner to be careful not to allow it to be exposed where bees can get access to it. I could relate many instances where this section of the law which forbids the sale or removal of bees, hives, combs, etc., from an infected apiary without the consent of the inspector has been a very great help in the control of the disease in this State, and I am very sure that the beekeepers of Minnesota would not agree for a moment to have this section or any other section of our law repealed.

When Mr. Pellett says, "The question has been discussed with many of the most successful inspectors and all have been disappointed in what they have been able to accomplish under these laws," does he mean to imply that "all these inspectors" believe that it is best to "make the office a purely educational one?" If this is the case, we ought to know it, and know the reasons why they do. If we are going to have a discussion regarding the laws necessary for the control of foulbrood let me suggest that it be along constructive lines rather than along destructive lines. It is very easy to tear down but not so easy to build again. I think we should go very slow in the wholesale condemnation of the present laws. Why not consider one thing at a time as for instance the quarantine law. Again conditions may so differ in the various states that what is a good law for one state might not be equally good for another. Let us go slow, fellow beekeepers, before we pull down what has taken so much work to construct.

Minneapolis, Minn.

The Other Side of the Question

A Reply to Mr. Blaker

MR. BLAKER has evidently overlooked the point of the article which he criticises. Had he read carefully the closing paragraph he would have noted that I do not propose to do away with the law which requires the proper attention to diseased colonies, but to leave the enforcement of the law in the hands of the officers whose business is law enforcement. The foulbrood laws were designed to protect the beekeeper, and to centralize too much authority in the hands of one man is to create a greater danger than is offered by disease. It should be the business of the inspector to locate disease and prescribe its treatment. It should be the business of others to enforce the law. The inspector should be an educational officer.

A recent number of the Western Honeybee made the statement that European foulbrood and **unwise inspection** had reduced the number of colonies in one California county nearly 50 per cent. The writer has heard it charged in some cases that healthy bees have been destroyed by the inspector. The law gave the beekeeper no protection in such a case. There are cases reported where bees were destroyed by an inspector to get them out of the way of somebody's range. Whether these things have happened or not, it is plain enough that they might easily happen under authority of present laws. There is no reason why the laws might not be so drawn as to give the beekeeper full protection in his property rights as well as from his neighbor's disease. I maintain that under the laws now on the books in several States it would be easily possible for a misguided inspector to ruin the beekeepers in his territory, and if reports are correct this very thing has happened in many cases. The beekeeper needs to be protected against an incompetent inspector as well as from disease.

FRANK C. PELLETT.

Use of the Hydrometer in Commercial Beekeeping

By Isaac Hopkins

AT your request, I am pleased to furnish you with some particulars of the use now made of the hydrometer in New Zealand beekeeping, and its advantages. In times past, and even at present in some countries, beekeepers have largely depended upon "rule of thumbs" methods for deciding important questions in connection with their business; purely guesswork, in which the results might or might not prove correct. Take, for instance, the tests I have seen advocated in a leading bee journal for deciding as to whether a sample of liquid honey is ripe or not. They were given in all sincerity and practiced by some in the absence of a more reliable method. One was to nearly fill a clear glass with the honey to be tested, leaving an inch or two of air space below the cover or stopper; turn the jar quickly upside down, and according to the rate at which the air bubble ascended; so the ripeness or otherwise of the honey was determined. Another plan, and this was advocated not long since in a bee journal by a not obscure beekeeper, was to test the honey for its viscosity or stickiness between the thumb and finger; if very adhesive it showed good condition, if otherwise its ripeness would be doubtful.

Now, it could never have occurred to these advocates that the temperature of the honey would make a big difference. On a cold day, the honey being denser than on a warm day, the air bubble would ascend much slower, and the viscosity would be greater, so that by either of these tests the same honey might be judged as ripe or unripe, according to the temperature of the honey when tested.

Then, again, in the making of honey vinegar, it is commonly recommended to test the strength of the liquid by putting an egg or sound potato in it; when the egg or potato floats showing a small disc above the surface it is strong enough; if they sink more honey must be added. The same test is advocated for honey mead, but as the strength of the liquid needs to be greater, a larger disc of the egg or potato must show. These tests are more or less guess work, as on the size of the disc the amount of honey in the liquid depends. The least variation in size of disc makes a big difference in the calculations.

Now, there need be no guess-work at all with regard to honey, vinegar

or mead; hydrometer tests will give absolute accuracy in each of them. Honey tests are the most important and here is where the hydrometer is of the greatest value. Some 30 years ago, when handling large quantities of honey from different sources, I received a great deal of it in liquid condition. In that state I could not judge accurately whether it was thoroughly ripe or not, nor can I to this day judge correctly liquid honey by its appearance. I may give a fair guess, but that is not enough. Several lots eventually fermented, most of it being the product of a family of very careful beekeepers who, I was confident, would take every care to avoid sending out doubtful honey. It may be said that if he honey had been all sealed before extracting there would have been no trouble, but I am not so certain of that. I have seen at different times the opinion of experienced beekeepers expressed that the sealing or capping of honey should not be implicitly relied upon always as an indication of thoroughly ripened honey. Be that as it may, I became fully satisfied at that time that some method within the capability of the average beekeeper to apply was needed to accurately test any given sample of honey without risk of mistake. It occurred to me that if the minimum specific gravity of the general run of honey produced in the country, would be discovered below which fermentation would take place sooner or later the object would be accomplished.

The opportunity for making a sufficient number of tests for the purpose of setting a standard did not occur till I joined the Department of Agriculture. In all I made some 250 tests between 1907 and 1912, experimenting with honey gathered in different seasons and from all sources. The result was I came to the conclusion that any of our honey of a specific gravity of 1.420 or over would not deteriorate under ordinary circumstances in any length of time. To test by time I put by samples of tested honey in glass jars (60 in all), some from each season from 1907 to 1913, when I resigned.

Last year (1918), when I saw them the honey was as good as ever. The minimum specific gravity of 1.420 is now officially accepted by the government honey graders, and the New Zealand Co-operative Honey Producers' Association, and no honey of a lower specific gravity is allowed to be exported or is accepted by the association.

In making honey vinegar, instead of the egg or potato tests for strength, the hydrometer should be used, and the same for honey wine-mead. The specific gravity of the liquid for vinegar of 1.040 contains 1½ pounds of honey, and that for mead 1.115 4½ pounds. The vinegar liquid of above specific gravity develops over 5 per cent acetic acid, quite a strong, fine-flavored article

Commercial beekeeping has so far advanced that we should discontinue the "rule of thumb" methods and adopt more accurate scientific measures. It should be mentioned that "Twaddell's" hydrometers are used, and the honey or other liquids should be as nearly as possible at a temperature of 60 degrees Fah., or 15 C.

Auckland, New Zealand.

Bees and Grapes

There has been more or less friction between the beekeepers and grape growers for many years. In wet weather the grapes often crack open, and when this happens at a time that there is little nectar in the field, there is likely to be trouble. When natural honey sources are scarce, the bees will suck up almost any kind of sweet product. At such times they often swarm over the vineyards, sucking dry the fruits which have cracked open. It is a well-known fact that bees will not injure sound fruit, but the grower is usually inclined to hold the bees responsible for the entire injury, since their work is so apparent.

In Southern California raisins are grown in large areas and hundreds of acres of raisin grapes are grown for the trade. Rains are not usual at the time the fruit is being dried. The grapes are spread out in thin crates which are piled one above another in the open field. Now and again a light shower damages the fruit seriously. The photograph shows the result of such a wetting and the work of the bees afterward. All the juice had been extracted by the bees, only the empty skins and seeds remaining. While this fruit juice is stored by the bees as honey, it is of poor quality and of little value to the beekeeper.

The National

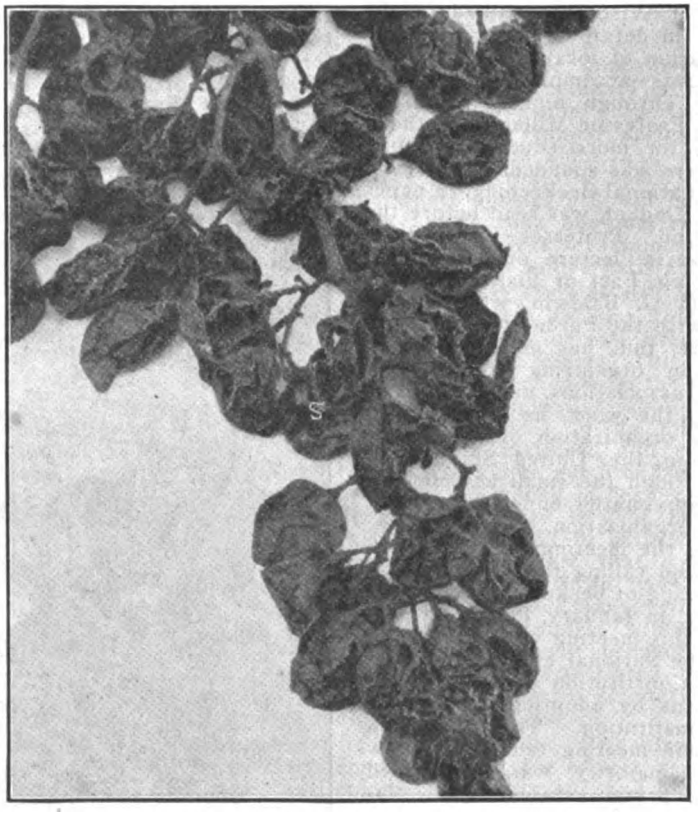
THE National Beekeepers' Association held its 49th annual convention in the East Room of the Hotel La Salle on Tuesday, Wednesday and Thursday, February 18, 19 and 20. This meeting immediately followed the Northwestern Association meeting which was very well attended.

The meeting was presided over by B. F. Kindig, in charge of apiculture at East Lansing, Mich., the president. David Running, being unable to attend on account of sickness.

The program was very interesting and kept the attention of the crowd which was in attendance. Professor Francis Jager gave a very interesting talk on "Beekeeping and the New Era," and also gave a very fine talk on European conditions.

Miss Iona Fowls, of Gleanings in Bee Culture, gave a very interesting and instructive talk on "Pushing to the Front in Beekeeping." This was followed by a paper given by Colin P. Campbell, president of the Michigan Affiliated Beekeepers' Association. His talk was for a stronger organization among beekeepers and the paper read by him later caused a resolution to be presented on this subject.

Dr. E. F. Phillips gave some very valuable information concerning the "Factors Influencing the Secretion of Nectar," although the doctor was unable to explain just why plants yielded honey on some occasions and did not on others when conditions were apparently the same. The convention had the pleasure of hearing Mr. W. H. Hall, connected with the Bureau of Markets, Chicago, Ill. Mr.



Raisin grapes that have cracked open after being wet. The juice has been sucked out by the bees.

Hall gave full information as to how the market reports were gathered and assured the beekeepers present that anyone who desired the reports could get them by simply writing to the Bureau of Markets at any of the cities in which such bureaus are located, or to the main office at Washington, D. C.

Prof. F. Eric Millen, in describing beekeeping as seen by a bee inspector, gave one an idea of the troubles and difficulties met by the bee inspector and showed very plainly that education is essential for the eradication of bee disease throughout the country. The fact that beekeepers are not acquainted with disease and means of its eradication is the prime cause for the spreading of foulbrood.

Perhaps none of the speakers attracted as much attention as Charles B. Justice, General Manager of the California Honey Producers' Co-operative Exchange. Although this organization has been in operation but a short while, there is great promise for what it will do for its members. Mr. Justice is an enthusiastic man and, without doubt, there is bound to be a steadying of the honey market through the efforts of his organization.

Kenneth Hawkins gave a talk on "Beekeeping in Dixie." Mr. Hawkins was in the employ of the Federal Government for nearly three years and covered something like 21 states doing extension work for the Department at Washington. Although Mr. Hawkins is no longer connected with the department, he is still closely in touch with it and gave valuable information as to general beekeeping conditions in the south.

Professor H. F. Wilson, of the University of Wisconsin, talked to the meeting in detail, the way in which organization of local beekeepers' societies was accomplished in Wisconsin. Through him, as well as through Professor Millen and others, the call for more education among beekeepers was sounded.

"International Beekeeping," a paper by C. P. Dadant, was read before the Convention. Professor E. G. Baldwin gave a lecture on "Extension Beekeeping, Fact or Fiction?" Professor E. G. Baldwin, who is connected with the Purdue University at Lafayette, Ind., has met with great success in organizing county beekeepers' associations, and devoted as he is to the work, he feels certain that the organization of beekeepers throughout the United States must come through the small associations located in counties under the regular Federal organization.

During the meeting, the resolution was passed calling for a representative meeting of beekeepers at Kansas City, Mo., in January, 1920. The purpose of this meeting will be to reorganize the National, either by amending the Constitution or changing it, or perhaps by adopting an entirely new Constitution. The discussion during the meeting tended to show that the majority was dissatisfied with the present status of the National and wished to improve it. A minority report, however, was brought in by two of the committee who felt that with the present machinery of the National, sufficient work could be accomplished if the right officers could be found to do the work. The motion, however, was carried, and the Secretary was instructed to call a meeting in Kansas City in January, 1920.

The best part of the National meeting came on the morning of the second day, when Doctor Miller appeared at the convention room door. To say that he was enthusiastically greeted is putting it too mildly. Dr. Miller and Miss Wilson were with us but a short time, but their presence rounded out the gathering as nothing else possibly could have done.

The officers elected for the ensuing year are as follows:

President—B. F. Kindig, Michigan.

Vice President—Miss Ada Sly, Michigan.

Secretary-Treasurer—Chas. B. Justice, California.

Executive Committee—David Running, E. S. Miller, Floyd Markham, Mrs. Cora Polhemus and Dr. A. C. Baxter.

L. C. DADANT.

Rendering Wax

By C. T. Ohlinger

OLD combs and pieces of wax that accumulate during the honey season, when honey is cut out of box-hives and bee-trees, can be rendered into marketable shape without extensive apparatus. The things necessary for a good job are two or three pails, preferably sap buckets that don't leak, a piece of burlap cut from a fertilizer or feed sack, a half dozen clothes pins and two floor boards, 3 inches wide and 3 feet long, hinged together at one end with a piece of leather, to be used as a press. If the boards have tongue and groove they must be shaved off so that no wax can run into them.

A home-made wax press.

In order to get every bit of wax we scrape the walls of the hive and the frames with a sharp knife clean to the wood. The combs and scrapings are crushed into one of the pails until about half full. Rain water, or soft water, is now added, just enough so that the pail will not boil over when on the kitchen stove to boil. Frequent stirring helps to separate the cocoons from the cells of the comb and thus more wax is gained. We try to use as much water as possible in order to get a bright and clean wax.

When the combs are all dissolved and boiling hot, the piece of burlap is pinned over the second pail as a strainer, and the whole mass poured into this pail. The ends of the strainer are now gathered into one hand while another person slips the boards around the bag thus made, gradually pressing the contents while the bag is being twisted until no more wax can be squeezed out. The remaining slum-gum is carefully scraped from the strainer, which is now used for the next batch. When the weather is cool and the bees are not flying we set the pails containing the strained wax anywhere outdoors, at other times they go into the cellar until the wax can be removed from the pails.

Angelica, Allegheny, Co., N. Y.

Hive Size and Comb Capacity

By Arthur C. Miller

THE accuracy of Quinby's observations and the soundness of his deductions are, after nearly seventy years, slowly being recognized. His hive size and comb capacity are being adopted by a steadily increasing number of beekeepers. To be sure, some wise ones, like the Dadants, the late Captain Hetherington and some living New York State beekeepers have long used the Quinby hive, or its equivalent, the "Jumbo."

It is not necessary here to recite all the history of the teaching and practices of the manipulative school of beekeepers, like Heddon, Hutchinson, Doolittle and others who thought to force and crowd the bees into the supers by taking away and transposing hive-chambers or parts, or to force an increase in population by "spreading the brood." I recently heard ne of the fairest minded and best posted beemen in the United States say that that manipulative school had done untold harm to the bee industry. The shallow Langstroth hive was urged particularly to force the bees to put their honey into the supers and the Danzenbaker was merely an exaggeration of the idea. In the train of such outfits followed all sorts of plans to increase and stimulate brood production. Feeding and feeders became a mania and a necessity. The preaching and practice of some who fed a little daily to stimulate a natural flow reminded one of the ancients who pushed in through the diminutive entrance of their hives a split alder stick with the pith removed. The contents of that tiny trough was thought suffi-

cient for a colony of hungry bees. Not so far different from the few ounces now sometimes advocated as daily food. This putting man's labor in the place of bees' labor may gratify the pride of some folks, but personally I prefer to let the bees work for me, and not me for them.

Mr. Quinby and his disciples believed in giving the bees sufficient room to rear, provision and house a goodly population, and while keeping an eye to the surplus yield, they believed in letting the bees store and keep a full larder. That well-stocked larder is one of the important factors in making and keeping the colony strong. That store of honey in the brood-nest acts on the colony as does the "governor" on a steam engine; it keeps the operation steady and uniform to meet the varying load.

One thing which engaged Mr. Quinby's earnest attention was the size of the hive brood-chamber. All writers of his and earlier days were widely at variance and he found it necessary to make his own observations and deductions. The size he settled on was approximately 18x15x 11 inches inside, and his frames were 18x11 (fractions omitted) and spaced 1½ inches between centers. And this size is used by the Dadants, and the Jumbo frame is, for all practical purposes, the same.

Just now there is again a discussion of hive sizes, comb area, etc., and with the light which the investigations of Dr. Phillips and Mr. Demuth and their a sociates have shed on the internal conditions of the colony in winter, together with their discoveries on the heat-producing methods and digestive limitations, we have undisputable evidence on which to work. It should result in dissipating some of the erroneous opinions and prejudices we now hold.

To realize that there is a wide recognition of the need of large brood-nests we have but to look at the increasing use of Jumbo hives and the advocacy of two Langstroth chambers. But the latter practice has its disadvantages, for it gives too much comb area, and in the wrong direction, also it calls for much of that expense article "manipulation" and much increases the capital invested.

As to comb areas and capacities the following figures are instructive. Assuming a frame full of worker-comb the cell numbers of different sized frames are as follows:

An L has 6,700, 10—67,000, 20—134,000.

A Jumbo has 8,500, 10—85,000, 20—170,000.

But there is another point beside the number of cells, to-wit, the storage capacity (cubic inches) for food, and there is a great difference in this respect between combs spaced 1⅜ inches between centers and those spaced 1½ inches. When combs are used for brood they are the same thickness (seven-eighths of an inch) regardless of spacing, but when used for stores, thickness increases as spacing increases.

The following table gives a fair approximation of the storage capacity of combs.

An "L" spaced 1⅜ has 117 cubic inches.

An "L" spaced 1½ has 134 cubic inches.

A "Jumbo" spaced 1⅜ has 149 cubic inches.

A "Jumbo" spaced 1½ has 170 cubic inches.

It will be well to keep in mind all numbers (brood capacity) and cubic inches (storage capacity) when considering sizes, spacing and numbers of frames and whether you will use two stories, or single stories and wider hives.

And if you are going to experiment with wider hives let me make a few suggestions which may save you a lot of loss. Make your hives wide enough so you can keep outer combs one-quarter inch away from hive sides. When not so offset, the outer surfaces of the outer combs are rarely used for brood, and will hold but half, or less, of the normal amount of stores. In other words, one whole comb is sacrificed. A good general rule to determine hive width is to make the inside width **one inch** wider than the aggregate width of the frames to be used in it, measuring the frames when **new.** Soon after the bees occupy the new hive the frames begin to swell and later propolis is stuck in. Strips of wood one-quarter inch thick are nailed on inside of one side opposite where edges of end bars come. That offsets comb from hive-side properly. Super springs, or similar springs, are used at opposite sides, and soon it will be found that the space on the side where springs are will be little if any more than one-quarter inch. Hundreds of hives so arranged have for years given entire satisfaction.

I realize that there is still held by many beekeepers an idea that thin combs operate to increase brood and force honey into supers. This is one of the evils inherited from the teaching of the manipulative school. You cannot **force** bees to do anything against their instincts, and even if their instinct is to put brood in shallow cells and honey in deep, remember that it takes lots of bees to raise lots of brood to gather a full crop. Quinby knew that, and the principles he laid down have stood the test of time. Coupled with the conditions of complete winter rest and maximum brood production in early spring, as enunciated by Dr. Phillips, we have what amounts to an almost new bee culture.

Say it this way: Big hives, big comb capacity, big winter rest, big colonies and big crops, and big bank accounts—if you know how to sell and all pull together.

Providence, R. I.

Sagging of Foundation

By J. E. Crane

IN regard to foundation sagging, we have no serious trouble when it is properly wired horizontally. We have used some ten to fifteen hundred sheets of light-brood foundation each year for the past four or five years.

One cause of the foundation comb sagging is insufficient ventilation or allowing the hive to stand in the hot sun. This will cause all kinds of comb to sag. Another is in placing the wires too low in the frame. Factory made and wired frames, as I have observed, are wired at about equal distances from top to bottom of frame. I took the matter up with one of our largest manufacturers some years ago, urging the desirability of placing the wires near the top of frames, but received little encouragement. I suppose they look better when wired away to the bottom. I visited an intelligent beekeeper last week in the northern part of our State who uses light section foundation in shallow extracting frames without wiring or sagging.

We used, I think, 1,000 frames of light brood foundation in Langstroth frames with three horizontal wires the past year in extracting supers, a pretty severe test, and they are as handsome a lot of combs as I care for. No, if one will place the wires at the top, or near the top, of the frame, where the strain comes, there need be little trouble with sagging. Of course, the wires should be drawn firmly into place.

We must aim at the trouble if we expect to hit it.

A fine, mild winter we are having, with snow enough so far to keep the ground covered most of the time.

Middlebury, Vt.

(This is plain, solid, common sense. In building their combs naturally, the bees finish the top rows before extending all the way to the bottom. But when full sheets of foundation are given them, they are apt to overload them before finishing the cells that are near the top, although the entire load is carried by the upper 15 or 20 rows of cells. So the wires that help to carry the load should be placed as near the top as convenient. One wire near the bottom is sufficient to prevent the sheet from warping. It is also very useful to have the wire imbedded, and we know of nothing better to do this than the electric imbedder.—C. P. D.)

The Hearing Sense of Bees

By A. F. Bonney

IN almost—I may as well say all—advance in knowledge, we argue from what we know to what we do not know, and this discussion regarding the sense of hearing in the bee will apply; while some argue from what they do not know to an erroneous conclusion. However, that is a common error, and needs but be corrected.

Because man hears we infer that other animals do also. That the vertebrates do allows of no discussion, for they have well defined organs adapted to the purpose. In the vertebrated animals these organs are complicated in structure, having, in the higher forms of life, an external ear; a meatus or sound canal ending in a drum membrane, the tympanum; then a cavity containing three small bones called the anvil, hammer and stirrup; then there are the semi-lunar canal and the labyrinth, and finally the tube extending from the ear apparatus to the throat, the eustachian tube, and this is as essential to hearing as any of the other parts, for if it be clogged no air can pass from the ear to the throat cavity, and the hearing is impaired. In the insect family there is no connection between the mouth and the breathing apparatus, as insects breathe through small tubes called trachae on either side of their body; hence we cannot argue from what we know about man's hearing apparatus to what we do not know about the bee; and further, we do not even know that there be any necessity that the bees hear. They have a wonderfully developed sense of smell and, I have reason to think, as keen a sense of feeling, and I am sometimes inclined to think that, as hearing depends on vibration of the air there would be no such thing as sound if there was no ear to hear it.

Now feeling depends on vibration both of the air, the conducting medium on which we stand, and the vibration of the nerves of the body and it is possible that, the bee being as sensitive to such vibrations as to odor particles in the air, feeling takes the place of hearing. However, in "Animal Life," by Lindsay, I read that Dr. Sharp, of Cambridge, has described their (the ants') "stridulating," i. e., noise-producing organs and Mr. Lindsay alludes to the sense of hearing in ants as "a fact." Other insects make noises, and it is theorized that they are for the purpose of attracting members of the opposite sex, but what I have said above may apply here.

We know that the bees have different "voices," as the contented "homing hum," the sharp "buzz" of anger or excitement, the sound the queen makes at certain times, and as there are notes pitched so high that the human ear cannot take cognizance of them, it may be that the bees produce other sounds inaudible to us.

Just recently a new sense has been discovered in the human, through the use of the fiying machines—the "motion sense" of aviators, which enables them to maintain equilibrium without the aid of vision. I once knew a man who could balance himself on the two rear legs of a chair and read aloud from a newspaper. A thousand trials failed to enable me to balance myself even ten seconds. Try it.

I have caused a shotgun to be discharged within ten feet of a hive where the bees were numerous on the alighting board, but failed to detect in them any indication that they heard the sound, while a very slight tapping with finger nail on the hive would excite them. I have yelled myself hoarse, but the bees paid no attention to me.

In our present state of knowledge I assume that it is safe to say that we do not know whether bees hear or not, and it affords an interesting field for study and observation.

Buck Grove, Iowa.

Home of Edwin Hutchinson, Avon, N. Y., paid for by 65 swarms of bees in four years. In addition, the bees bought some Liberty Bonds and furnished a living for two.

Mating Queens Over Colonies

REFERRING to the article on page 57, February number "Mating Queens Over Colonies," I wish to say that I have had as good success mating queens over colonies as with some of the other methods. It is possible that it was due to good luck and awkwardness rather than to the method used.

As a beginner, I have produced some excellent queens by various methods, and when ready to place virgin or ripe queen-cell over a colony I paid no particular attention to putting up frames from the lower brood-chamber, but put up frames containing brood in every stage of development.

In choosing and preparing my hive

for mating purposes, I select a strong colony, having one or more section supers, in which the bees have commenced to work. On top of these I place a honey-board, on top of this I place what I call a "mating bottom," which is made in the following manner: Make a frame to fit the hive, dimensions of which are 1¼x7⅞ inch. On the bottom of this frame I tack a sheet of tin, covering three-fourths of the frame; bore two or three half-inch holes in the back end of the frame, and for the entrance tack a piece of tin bent at right angles below these holes for alighting board. Over this put your brood-chamber with the brood frames and virgin or ripe queen-cell, and in due time you will find a laying queen.

I have mated two queens in the same brood-chamber in this way and would also get the frames filled with honey, which was extracted, or could have made a new colony strong enough to winter well.

I would like to mention another experiment which I have tried. The idea is not original with me, but I have never seen it in print that I remember of. I have seen the time when I wanted to graft some queen-cells and had no royal jelly. I have used a mixture of water and honey, well mixed, used the same as royal jelly and had 87 6-10 per cent of the cells accepted and 85 per cent were finished and were as well developed queens as I ever saw.

I have been in the bee business since 1918, but have done nothing but try experiments, and try to do what the other fellow has done, and more.

L. A. Shawler,
West Union, Ill.

Treatment for Foulbrood

A western subscriber requests that we specify briefly the latest treatment advocated for American and European foulbrood. Briefly stated, for American foulbrood is to remove the bees from the infected hives, destroy all comb and remove all honey, and placing them in an entirely new and clean hive, as one would treat a new swarm. The essential operation in the treatment of this disease is to remove the bees entirely from all sources of the contagion. It is especially important that no honey from the diseased colony is allowed to reach the bees in healthy colonies. The old hive and frames may be used again if thoroughly cleaned before coming in contact with the bees.

With the European foulbrood it is not necessary to destroy the comb. The important thing, with the European foulbrood, is to have the colony strong and to check breeding operations for a period of time until the bees have had opportunity to remove the infected material. It is usually advisable to re-queen the colony with selected Italian stock from some well-known disease-resistant strain. To be successful in the treatment of the European foulbrood the colony must first be strong and the brood-rearing must be checked for a period sufficient to enable the bees to clean up.

DR. MILLER'S ANSWERS

Send Questions either to the office of the American Bee Journal or direct to DR. C. C. MILLER, MARENGO, ILL. He does NOT answer bee-keeping questions by mail.

Average Yield, Per Colony

Would like to ask C. P. Dadant the following questions, to be answered through the American Bee Journal:

1. What has been your average yield of extracted honey per colony for the past 20 years, if these figure are available? If not the 20-year average, would like the 10-year average; and, if not too exacting, list the last 10 years by each year. My reason is to see by comparison with the weather of Illinois Bulletin issued by the Illinois Experiment Station just what season proved the best regarding rainfall.

2. Will a wet August and September, following a dry summer, with a liberal amount of rain the following spring and summer, produce a very good crop of white clover?

3. What conditions do produce the best crop of white clover?

ILLINOIS.

ANSWERS.—1. We have been rather lax in keeping accounts of our crops. We should make statistics. But business and the hurry of each day seem to prevent us from doing a thousand things that ought not to be neglected. The best I can do is to give a rough guess of our crops one year with another, and this I would place at about 40 pounds per colony.

Drought is the worst enemy we have. The coming summer is likely to prove unprofitable to bees on account of last summer's drought that killed nearly all the white clover about us.—C. P. D.

2. Very likely

2. A winter that will not kill out the plants, preferably one with a good blanket of snow, in northern localities, the ground having been well filled with moisture in the fall; then enough rain and warm weather for luxuriant growth up to the harvest; hot, sunshiny weather during the flow, with a tendency toward drought toward the middle of the flow. Other factors, such as electrical conditions, no doubt should be considered.

Wintering—Transferring—Flax

1. I have the 10-frame hive of Hoffman frame and I am thinking of putting a shallow super filled with leaves on top of this and winter them out of doors in a winter case. Do you think this would be all right?

2. I have one colony in an 8-frame hive in which the combs are crooked, and I am going to transfer them to a 10-frame hive. When would you think it would be the best time to transfer them, before swarming or after? Would the bees go into the new hive all right?

3. Is flax a honey-plant?

WISCONSIN.

ANSWERS.—1 Yes; but protection at sides and bottom would still be needed.

2. In fruit-bloom is a good time. There will be no trouble about the bees going into the new hive if it is set on the old stand.

3. I think it is, but not a very important one.

Cellar for Bees

1. I am planning on building a honey-house with bee cellars underneath, size 16x26 feet. Do you think that will winter 150 colonies?

2. Will dig into side of bank and will have cellar all below frost line; cement walls and floor, and want to ask if you would have ceiling made of cement or wood; some say wood will rot.

3. Would you put in ventilators, and if so, what kind?

Would appreciate any other information that you can give me on this subject.

Am planning on leaving an air space between ceiling of cellar and floor of honey-house and packing with cut straw.

NEW YORK.

ANSWERS.—1. Yes, you will need to pile them only four or five high to accommodate 150.

2. Cement will last longer than wood, although wood ought to last many years.

3. It doesn't matter such a great deal as to the kind of ventilator, whether of wood or metal; but it is important that the one to let in the air be low down, and that the one which carries out the air should be fairly high at the outside. If the ventilators be 6 inches in diameter they will probably be larger than will often be needed, but you can close up all you want to, and if the diameter be too little there is no way to enlarge it. If the earth is sandy and you leave an earth floor, little ventilation may be needed.

Frames—Queen Rearing

1. Can an apiarist make frames for his own use; for instance, the Hoffman frame?

2. Would a young queen likely be mated from a drone of the same hive?

3. Would it be a good time to raise a queen in fruit blossom time?

4. How many cells would a colony of strong bees be able to handle? Could they finish them, or should they be given to another colony above an excluder, with queen below?

5. Should honey be extracted as soon as capped, or left a while to ripen?

6. Which bee has been known to work on red clover the most?

7. How many days will it take for a queen to hatch from a very young larva.

IOWA.

ANSWERS.—1. The frame is the one thing about the hive that needs most exact workmanship and special machinery, and without this last the most expert mechanic would hardly think of making his own frames.

2. Small chance for it if other bees are within a mile.

3. Hardly, as a rule too much cool and catchy weather.

4. I suppose t isn't so much a question of what they can do as what they will do. Some colonies will mature 50 or 100 cells, others 10. There would be no likelihoods of a greater number being finished by changing them to an upper story.

5 Generally it is considered ready to extract as soon as sealed, although leaving it longer on the hive will make it a little richer.

6. I don't know. Claims have been made that this one or that one excels; but none too much is known about it. Likely there's more difference in clover than in bees.

7. If you mean larva just out of the egg, about 12 days.

Marking Queens, Wintering, Etc.

1. Have you had any experience with, and what do you think of, the plan of painting the back of the queen to facilitate finding her, as described in the January number of the American Bee Journal, page 21?

2. Is the Demuth method of packing bees for outdoor wintering a success? Will you please tell us just how the frames are rigidly held on end so as not to topple over?

3. After a Demaree super has been given in case of a prolific queen, would it not be a good plan to *again* move the brood above after the lapse of a few weeks, in order to give the queen abundance of room?

In wintering bee on the summer stands do you think there is any advantage in placing another hive-body between the bottom-board and the brood-chamber? As I use the Demaree plan, I have plenty of hive-bodies that I could use in that way, either with or without the frames of drawn comb. MICHIGAN.

ANSWERS.—1. I have had no experience in the matter, but have read a good deal about it, and have confidence that queens thus marked are much more easily spotted than queens not marked. There are two reasons for thus marking queens. One is that you may know the age of a queen. I don't need to mark a queen for that purpose, since my book tells me the age of a queen, and I can tell the age of a queen any time of the year without opening a hive, unless the queen has been superseded, and I can tell that by her whole wings. If I lived in Switzerland, however, I might think it worth while to mark queens for the sake of finding them more easily, for there they prefer black queens, and they are harder to find than Italians.

2. I have never tried it, as I cellar my bees, but from the testimony of others it seems quite a success. I don't know whether any means are used to keep the frames rigid, but should hardly suppose it necessary. I have sometimes set the hive on end, and there is no danger of the frames toppling over unless they are turned beyond the perpendicular.

3. It might be a good thing in some cases, but usually by the time a second shift would be made the queen has slackened in her laying so that she has enough room.

4. I think there would be advantage in it. With an entrance a little above the bottom-board there would be no danger of the entrance being blocked with dead bees, and there would be the advantage, probably an important one, that the cold wind could not so easily reach the cluster.

Re-Queening—Increase

I have about 25 colonies of bees, black and hybrids all in 8 and 10-frame Tri-State hives, and I want to Italianize them all this spring and make some increase by introducing queens and 1 or 2-pound packages, with three or four objects in view. First, to get Italian stock. Second, to have them strong when the white clover flow opens Third, to control swarming, and to work with the object in view of getting rid of all unnecessary drone-comb in the future.

I had thought of following this plan (close to the Demaree plan): I will take one hive, to illustrate, a hive that is strong at time of apple blossom, or later as you would advise. I will take one frame of brood (or two, as you would advise) out of old hive, place it in a new hive, fill up with full sheets of foundation and place old hive on new hive on old stand, with queen-excluder between; leave till time to introduce packages and queen. Then move the old hive to a new location and from 24 to 48 hours (as you would advise), hunt out old queen and introduce the packages with queen into old hive by liberating in empty super with perforated cardboard on bottom, with small opening in center for them to enter brood-chamber below. How soon would it be safe to introduce a new queen in the new hive that was left on the old stand? Or should I not want to Italianize them, would they readily receive the old queen after being without her 24 to 48 hours; and would it be necessary to destroy all queen-cells in introducing by this plan. ILLINOIS.

I'm not sure that I am competent to advise about a plan I am not acquainted with, but I'll try. You do not say whether you will leave the queen above or below the excluder at the time the excluder is given, but I suppose you will leave her below, and I wouldn't leave more than one brood with her; and unless the colony is very strong in fruit bloom you will do well to wait till the blooming of white clover. It will be well to wait 48 hours before introducing the new bees into the old hive on the new stand, and it will not be necessary to use the super and cardboard, for there will be only young bees in the hive, and the new bees and queen should be directly received. Still the extra precaution will do no harm. But in the other hive more precaution is needed. Either 24 or 48 hours after the old queen is removed the new bees with the new queen may be given, and your cardboard may be used ,although a newspaper will answer. Brush off all the bees from one or two frames of brood; put these in an upper story over the cardboard or paper and put the new bees and queen on these combs. After being absent 48 hours, the queen could be safely returned without killing cells.

Floors—Increase

1. Would concrete be all right for a honey-house floor? If not, why would you object to it?

2. What is your method of running a colony for comb-honey production.

3. What is the best method of artificial increase and yet secure a crop of honey.

4. Would Italians and Carniolans crossed be a good cross? ONTARIO.

ANSWERS.—1. I don't know from experience, but I should suppose it would be all right.

2. To give even a brief answer to such a question would be beyond the scope of this department, but in my books you will find in detail just how I manage when running for comb honey.

3. "You cannot have your cake and eat it, too," and if you make increase you must count on a smaller honey crop, unless in a location where an exceptionally heavy crop comes late. However, you may make increase and get a seasonable crop, and perhaps you might like the Alexander plan. When a colony is very strong, put all but one brood in a second story, leaving one brood with the queen in the lower story, with an excluder between. Kill any queen-cells that may be present and fill all vacancies with frames of foundation. In 5 days, if you find queen-cells started in the upper story take it away and set it on a new stand, leaving it to raise its own queen. If the colony is not of good enough stock to breed from, then all cells should be killed at the end of 5 days and the upper story of brood left over the excluder 5 or 6 days longer. It should also be left 5 or 6 days longer if no cells are started. At the end of this time, that is, 10 or 11 days from the time of the first operation, the upper story should be set on a new stand, and 24 hours later a laying queen should be introduced, or else a virgin or a ripe cell.

4. Yes; but I should prefer pure Italians.

Increase

1. Last spring a second hive-body was put on a stand of bees. This spring they will be strong enough to divide. Is it preferable to introduce a new queen into one stand when they are divided, or to allow them to raise their own queen?

2. About what time should they be divided?

3. A swarm is to be transferred from a box-hive. Your statement in "Thousand Answers," page 253, edition of 1917, would indicate there would be no queen in the old box at time it was broken up three weeks after the swarm issued. Is this correct? KANSAS.

ANSWERS.—1. You are assuming quite a bit when you say they will be strong enough to divide. You gave them a second hive body, and it is possible that both stories will be occupied in the spring, but more likely only one, and *possibly* that one may not be half full. At any rate, when you do divide there will be an important gain to give the queenless part a laying queen rather than to let it rear its own queen.

2. Wait until about the time colonies begin to swarm naturally in your locality, or until the opening of white clover, and not then until the colony is strong.

3. Oh, yes; there will be a young queen in the old hive, but you will pay no attention to that. If, upon uniting, the young queen is killed, it will be all right, and if the young queen kills the old one, that will likely be better still.

Royal Jelly—Foulbrood

1. From what is royal jelly made, and can it be made artificially?

2. Describe American foulbrood, also the difference between American and European foulbrood.

3. What is the most effective way to introduce queens?

4. What do you think of Mr. C. B. Bankston's queen mating nuclei? Do you think it as effective as the baby nuclei? VIRGINIA.

ANSWERS.—1. The bees make it of honey and pollen, somewhat as a cow makes butter out of grass; but I don't think it can be made artificially.

2. The outstanding symptom of American is that when you thrust a toothpick into it and draw it out the dead matter will string out in a thread an inch or two long. In European the dead larva has a yellowish look.

3. Perhaps as good as any is the usual one of caging the queen in the hive in such a way that the bees will let her out of the cage in 3 or 4 days.

4. I do not recall just what it is, but I would expect that anything C. B. Bankston uses would be good.

Moving Short Distance

I have 26 colonies of bees which I desire to move a distance of about 50 yards to a shed which I have prepared for them. Now, I do not wish to do anything that will cause a very great loss of bees and thus work against my honey crop.

How and when can I move them with the least loss of bees?

Is it best to move them after a confinement of a few cold days, or had I better wait till nice, warm weather?

Will there be danger of their drifting very much?

I have owned bees ever since I was a little boy, but never had experience in moving any even a short distance. KENTUCKY.

ANSWER.—Don't wait for warm weather, for the longer they have been flying the worse they will be about flying back to the old place. Put a board in front of each hive entrance after you put them on the new stands, and before you open the entrance of a hive pound good and hard on the hive, so as to get the bees to roaring. That will help to make them mark the entrance and the new location. There ought to be no great trouble about drifting. In spite of your precautions, some bees will likely return to the old location. To catch these let a hive containing combs with a little honey, or else empty combs, be set in the old location, and each day, as long as the bees keep returning, let the bees be brushed from the combs in front of any hives in the new location.

Packing for Winter

1. To winter bees out doors in central Indiana, how would it do to place hives on a platform in a row, covering them with tar paper cover all over except the entrance, and over the top place tin to shed the water?

2. Would you leave the hives as close together in the summer? INDIANA.

ANSWERS.—1. To pack in that sort of wholesale way would be less expense and labor than to winter in smaller groups or singly, and this obvious fact could not fail to have been suggested to anyone studying the problem. The fact, however, that it has not generally been adopted is pretty clear proof that experienced practitioners do not consider it a very satisfactory way. One trouble is that the bees would be likely to enter wrong hives.

2. By no means. There would be too much mixing of bees from different hives.

Spacing Frames—Sweet Clover

1. Do the Dadants use the wire spacer at the bottom of their deep brood-frames? Are they necessary?

2. How could I fix my Hoffman frames so they would space 1⅛ inches from center to center? Would you advise me to use the staple-spaced frames for 1¼ inch spacing?

3. Shou I use something to keep the enamel cloth from touching the frames? What could I use?

4. Would two division-boards, one on each

side of the cluster, be sufficient protection in spring (I winter my bees in the cellar) in northern Michigan?

5. Are the unspaced frames very much in use?

6. If I use a screen bee-escape board on top of the super and raise the hive cover one inch for ventilation, would that be too much?

7. Could I get the Dadant or the unspaced frames and space them 1¼ inches from center to center with staples at top and bottom?.

8. If I use a wooden barrel to make a honey extractor, will the wood affect the honey in any way?

9. Along the east shore of Lake Michigan, where I live, there is a steep bank about 200 to 300 feet high. Between this bank and the lake there is a narrow strip of land about 100 rods wide which is heavy clay ground where red clover and wild peas grow. Would sweet clover grow here, and would the bees go the distance of a mile to get the nectar?

MICHIGAN.

ANSWERS.—1. Yes, they use them, but they are not essential.

2. You can use staples or shingle nails.

3. When enamel-cloth is used it is supposed to rest directly upon the top-bars. I prefer to use no cloth, having a flat board cover directly over the top-bars, with a bee-space between.

4. In cellar you need no such protection.

5. I don't know; I think the majority are self-spacing.

6. If raised at one end, half an inch should be enough. If raised all around, a fourth to three-eighths should do.

7. I think so.

8. That depends on the kind of wood. In any case it would be well to have a coating of paraffin or wax.

9. Sweet clover should do well there, and the bees would think it no hardship to go a mile to visit it.

Surplus Pollen

When we look over the colonies in the spring we at times find combs nearly full of beebread, old and hardened. Would it not be better to take such combs out altogether and give new combs, as it seems to me the bees will not, or cannot, use the bee-bread plugged cells unless they spend much unnecessary labor? WISCONSIN.

ANSWER.—Yes; in a bad case it is probably better to melt up the comb and start afresh. In some cases it is possible to jar the pollen out of the comb when it is thoroughly dried.

Moving Short Distance

I shall have to move one of my apiaries about a quarter of a mile after this season's clover flow. I do not like to move the whole apiary twice to do this job. How would it work to move the greater part of the apiary direct to the new location, leaving a few weak colonies to catch the bees that return, and then move these to another apiary? OHIO.

ANSWER.—You could do that way, but I think I would prefer this way: remove *all* the colonies, and leave in the old place a hive containing empty combs. The returning bees would settle on these, when you could take them to the new location, shake off the bees in front of any colony or colonies you liked, and then take the combs back to the old place, repeating this until the bees gave up returning.

Transferring From House Wall

Will you please inform me the best and most sure way to capture a swarm of bees that is located in a house, the entrance being a crack where the porch roof joins the siding of the house? The people prohibit taking off any boards.

When is the best time to do this?

KANSAS.

ANSWER.—I'm afraid I can't help you much. It is barely possible that you might manage to inject carbolic acid or some other substance so offensive to the bees as to stampede them entirely, making queen and all rush out of the entrance, when you might stop the entrance and capture the bees. You might also capture a good part of the bees by attaching a bee-escape to the entrance, say in fruit bloom or at the beginning of clover bloom, getting them to settle on a frame of brood or an empty brood-comb. This could be given to any colony you like, and the performance repeated about every 10 days.

Honey on a Virginia Island

I want to know about the location, sources of nectar and your advice in general. The place is Chincoteague Island, Accomac County, Virginia, situated on what is known as the eastern shore of Virginia, extreme northeast corner of the State, 5 miles from the mainland, you might say in the ocean. It is an island containing 7 square miles, with another adjoining containing about 4 square miles; both have lots of pine forest, some black gum, holly, oak, cedar, persimmon and a few locusts on my place. The 38th degree of latitude is just north of both islands. Blackberries and other berries that I do not know the names of; also an abundant growth of wild flowers that bloom in spring, summer and fall; also some fruit bloom. No clover or buckwheat grow wild, nor are they cultivated. No bees on the place, only bumblebees, as far as I know of. Only uncultivated plants, etc, for the bees.

What do you think of it for a back lot apiary? If it is good, and I should succeed, I would eventually cover the whole acreage with a few colonies placed elsewhere than at my home, and plant clover if I could get it to grow on so low an elevation—about 4 feet above the sea level on an average. Once in a while (about 5 to 7 years) the place is flooded with salt water from the ocean; only the highest points left out. Fortunately my place is one of them.

My idea is to start with about 4 colonies, using Jumbo 10-frame hives, and running for chunk honey, as the demand there is most favorable for that kind of honey. I will buy what extracted I have a market for.

I was told that it would be a good location for a queen breeder, for pure stock.

VIRGINIA.

ANSWER.—I don't know enough to say whether your prospective location is a good one for bees or not. I should be a little afraid that the pasturage is not of the best kind, but it may be better than I think. Your plans are all right if you only have the nectar. If you are counting on a continuance of some years, it might pay big to scatter widely seed of white and sweet clover. I don't know whether clover will grow for you, but should be very hopeful of sweet clover. Even if it should grow poorly at first, it might be increasingly successful in time, and it might be a good thing to apply to the U. S. Department of Agriculture for material to inoculate the seed or the soil. In one respect there is a possibility that you have struck a bonanza in one thing you have mentioned. If you become an expert at rearing queens you are all right for that business, even if you cannot get very good crops of honey, for if there are no bees on the island that you cannot control you are sure of pure mating, a thing that very few can boast of. Under the conditions mentioned you could guarantee absolutely pure mating, and that's perhaps half the battle in queen-rearing.

Virgins—Moisture—Old Combs

1. What kind of honey in flavor and color does the Scotch broom give. My bees are busy on it as long as it is in bloom, but there are only three or four bushes in my reach. One beeman, two miles away, near a fair patch, gave me a sample that he says his bees gathered from this Scotch broom. Very thick, wine or cherry color, a little strong in taste to me, but pleasant to others who tasted it.

2. In requeening, what is the proportion of satisfactory to unsatisfactory virgins?

3. In maintaining two queens, one above an excluder, has anyone ever introduced a queen to the upper story without waiting for one to be hatched?

4. I have the 10-frame dovetailed hives. One, upon examination this spring, had moisture dripping and the inner cover of the metal cover was swelled tight, and the other hives had nothing like this. The entrances were cut to 5 inches.

5. Do the brood-combs ever have to be thrown out, or how long are the bees able to use the same combs? WASHINGTON.

ANSWERS.—1. I have never heard of this honey before, and perhaps it may be left for you to find out about it and tell the others.

2. Likely you mean what proportion of virgins become laying queens. I don't know; possibly three-fourths, although sometimes much less.

3. Yes.

4. Perhaps this hive was closed more tightly on top than the others.

5. I don't know that they ever become too old, if the combs are good and straight.

Pollen—Louisiana for Bees

1. When bees are gathering abundant pollen do they gather less nectar for their use?

2. Is Louisiana a good State for bees. I am here first year LOUISIANA.

ANSWERS.—1. When bees go afield they gather nectar in most cases without any pollen. They may gather both nectar and pollen, and for all I know they sometimes gather pollen without any nectar. A bee that carries a heavy load of pollen would hardly be expected to carry as much nectar as it would if it had no pollen. But it should not be forgotten that it is just as important to have pollen as nectar; and if a bee should never carry anything but pollen, it is doing its full share toward securing a honey-crop.

2. I think it is so considered.

Bees From Trees—Strong Swarms

1. Is there any way of smoking bees out of a bee-tree? How? When?

2. Is there any danger of not getting the queen?

3. Is there any way of attracting stray swarms? NEW JERSEY

ANSWERS.—1. They can be gotten out by blowing enough strong smoke, or putting in enough carbolic acid or other substance offensive to the bees. If the object is merely to get the bees there could be no better time than in the spring, before much or any brood is present.

2. Unless all the bees are gotten out there is danger that the queen may be among the last.

3. In a number of cases I have had stray swarms occupy empty hives standing in or near the apiary.

Sorghum for Bee Feed

1. Do you think that real good quality, nice, clear, light colored sorghum molasses would answer as winter stores for bees, or if not, how would it do if mixed with sugar?

2. Is there any preference between the white and yellow varieties of sweet clover as honey-producing plants, as to growth of plant or yield of nectar? ILLINOIS

ANSWERS.—1. I don't believe that it would be well to have even a very small quantity of molasses in the bees' winter food.

2. Yes; the white is preferred. Both are good.

Dead Brood—Requeening

1. When I took my bees from the cellar this spring I found one dead colony. I think starvation caused their death. On one frame I found a patch of dead brood about the size of the palm of my hand. This brood was sealed, but the caps were not sunken; the dead brood gave off no smell and was not the least bit ropy. This colony was short of stores in the fall, so I fed them about 5 pounds of honey. When I put them in the cellar they had brood in all stages of development. What do you think caused the dead brood?

2. Would it have been better if I had removed the brood before putting in the cellar?

3. What do you think of introducing queens by smearing with honey, as advised by F. M. Baldwin on page 200 of the June, 1918, American Bee Journal?

4. Would the first part of July be a good time to requeen? We have a good fall flow here. MINNESOTA.

ANSWERS.—1 The brood probably did not die till the bees died, and then it chilled to death.

2. There was probably some wrong condition

that made brood in the hive at time for cellaring, and taking out the brood would likely not have helped.

3. Some report entire success; but others are not so successful.

4. Yes.

Unpacking Goldens—Royal Jelly

1. When could I take four stands of bees out of a shed? When I bought them it was almost too late to pack them.
2. When is the correct time to unpack my bees?
3. Would you advise me to buy Golden Italians, or the leather colored?
4. Are the Goldens as good?
5. Would it be too early to divide before the white clover flow, about June 15?
6. Or would this check the honey-flow to a certain extent?
7. Do you get royal jelly out of queen-cells?
8. If so, what part? and can it be saved in a bottle?
9. Should I put any syrup or flour out for my bees now?
10. How do you feed inside the hive when packed?
11. How much honey should I expect from a colony that has never had much care, but is in a good hive with straight foundation?
12. I have eight stands, four well cared for and four that are not. How much honey should I expect and make an increase of eight colonies?
13. Will they make 800 pounds or more?
14. How would you advise me to sell this amount, in 2-lb. cans, 5-lb., or large cans, and ship it? INDIANA.

ANSWERS.—1 and 2. Unless there be danger of starvation or some other reason for disturbing them, it is better not to unpack until it is pretty warm, say toward the end of May. That is equivalent to saying that the bees in the shed should not be moved till then. If, however, you had taken them out before there was any flying to speak of, there would have been less trouble about bees going back to the shed when taken out of it.

3 and 4. There are good and bad in each; but on the whole, I should prefer the leather-colored.

5. Yes, if you want the most honey; no, if you want the most bees. Yet in regions where the chief flow comes late, it might not be too early for either purpose.

6. If you divide at the beginning of the clover flow you will pretty surely get less clover honey than you would to leave the colony undivided.

7. You can, if you want it; but in the practice of some no jelly is needed to start cells. The bees will produce the jelly without your taking any out of queen-cells, if they need it.

8. The whole of the pap-like substance found in a queen-cell is royal jelly, and some report keeping it some time corked in a bottle.

9. Putting out syrup may be a good thing if the bees can get nothing from the flowers and you don't mind feeding neighboring bees; and it does no harm to put out some kind of meal if the bees get no natural pollen.

10. You can't without at least partly unpacking.

11. Anywhere from nothing to 200 pounds. But you're more likely to have nothing than 200 pounds.

12 and 13. I couldn't tell at all. The location, the season, the bees, and other things have much to do with it. Then that "well cared for" is a varying quantity, depending on whether it is the care of a beginner or an expert. To double the number of colonies and get 800 pounds of honey from eight colonies could hardly be expected. To get 300 pounds would be doing well.

14. Likely you will do better to sell near home. Size of container depends on market; likely the 5-pound size may be best.

BEE-KEEPING FOR WOMEN

Conducted by MISS EMMA M. WILSON, Marengo, Ill.

Starting With Bees

My Dear Miss Wilson:

I am also a woman and anxious to succeed with bees, although I know nothing about them.

Will you kindly tell me how I can best make a small start, where to obtain information, what month is the best to start in, etc.

We recently moved to this place and there are some hives and a stand in the yard. The last lot of bees were killed by moths. How can I clean and fumigate the hives, etc.

MRS. HENRY B. McVEIGH.
New Sharon, Iowa.

There is no better time to start with bees than in spring, say about the time fruit trees are in bloom. Then the risk of wintering is over. Better not start with more than two or three colonies, and then you can increase in numbers as you gain experience. Get Italian bees, or you can Italianize them afterward.

For information about bees you can take First Lessons in Beekeeping, a 175-page beginner's book, by C. P. Dadant, price $1.00. If you want a larger work, you can get Langstroth on the Honey-bee, a full treatise on bee-keeping having 575 pages, revised by C. P. Dadant, price $1.50. A thousand answers to bee-keeping questions, by Dr. C. C. Miller, a book of 290 pages, supplements other books by answering questions not usually taken up. Price $1.25. You can get any of these books at the office of the American Bee Journal, Hamilton, Ill. Sooner or later you will be likely to want a monthly bee journal, but be sure to have a book first.

If the old hives have been in complete control of the bee-moth, they have probably destroyed the comb, so that all you need do is to scrape out the remains and no fumigation is necessary.

Any further questions you may have will be cheerfully answered in this department.

Beekeeping for Women

Beekeeping for women can be divided into two parts; first a hobby, second a commercial industry. Every woman, though she be a busy housewife, should have a hobby or something to turn her mind to besides 365 days of cooking, washing dishes, doing the family washing, ironing and mending. For it has been proven that years of this kind of work has given us a crop of pale, nervous, dissatisfied women. 'Tis true most of us do embroidery work, lace making, or something of this nature, but I do believe we should have something to take us out of doors, giving us fresh air, nature study and make us forget ourselves.

To me beekeeping is the most fascinating work I ever studied, and as I said, we should have a hobby, why not have one that gives financial returns as well as pleasure. Now, for the new beginner, don't try too many colonies, and remember there are three important things to be remembered, viz., neatness, self-control and patience. Don't forget this last word, patience, for bees do not approve of this hurry habit so many of us have fallen into. Neither do they approve of slovenly, dirty ways, and if we are neat and patient we must have self-control; having these three things in mind, get a few colonies of bees in good hives, a good, practical book on beekeeping, and, if possible, get some beekeeper to help you get started, for reading books alone is not so helpful as working with some beekeeper.

Some woman says, "I can't think of being stung." There are worse stings than bee-stings, and with the use of gloves and veil, bloomers or coverall suit, stings become a small factor in beekeeping. One can get hives complete, but I believe most women will enjoy the making of hives, especially the inside fixtures. I enjoy all the work except the painting.

One thing in particular I wish to mention, don't forget to use full sheets of foundation in hive-body; in fact, prepare your whole hive the best way possible.

One must not expect everything to be lovely, for beekeeping has its ups and downs, as well as any other vocation one might engage in.

Perhaps the heavy lifting is one of the greatest drawbacks for a woman beekeeper, but generally there is some one around who can assist in the lifting. I think for the woman who finds help scarce comb honey is the most profitable for her to handle. Then, too, there is something fascinating about preparing comb honey for market, and I do not see anything fascinating in turning an extractor, but this can be decided by each individual.

Now for the financial side of beekeeping. I have in mind several women who keep bees as a side line for their own money. All of these women have families to care for and help with other outdoor work. One single woman handles 70 colonies successfully and does most of the farm work alone, her father dying a year ago this winter.

I believe the woman that takes up beekeeping as her hobby or for her self-support, will at the end of the year find herself better, physically, and mentally, and a better companion for her fellow men than the little indoor woman.

MRS. ROY BUNGER,
Eskridge, Kans.

(Not every woman would agree that it is better to produce comb rather than extracted honey. To be sure

here is nothing very romantic about urning an extractor, but neither is craping bee-glue off sections, with he sticky dust flying, anything so very enchanting. It must be confessed that when the finished crop s ready for market, the sections present the finer appearance, but it takes more skill to produce them. After all, the deciding factor for each one depends upon which is the more profitable, and that each one must decide for herself.—Ed.)

MISCELLANEOUS NEWS ITEMS

Cure for Yellow Jackets

On page 98 of the March number of he American Bee Journal, under Dr. Miller's answers, I find some one rom Washington asking about yelow jackets. Here is a **sure,** not too ard, **cure.**

Get, fresh from the butcher shop, a couple of pounds of beef liver (fresh meat) and cut into pieces two and one-half or three inches long by one inch thick. Work into this liver with a knife about one-quarter ounce of either arsenic or Paris green to the pieces. The latter is best, and hang up out of the reach of cats and dogs, by a wire, somewhere around the apiary, or near the honey-house. The yellow jackets do the rest, and, as a rule here, do not bother for a couple of years; then another dose. It seems to clean out both the flying and embryo jackets, as they are meat eaters and will work for nearly a week on one baiting.

CHAS. F. SCHNACK,
Escondido, Calif.

Paste to Stick Labels to Tin or Glass

The following formula by W. C. Raymond, in Gleanings, will do it:

Half an ounce of silicate of soda (or, rather, common water glass), 1 ounce corn starch, 1½ pints of water. Add the starch and silicate of soda to the water and stir till uniform; then place the dish in another vessel of water and heat till the starch is gelatinous.

LEROY FLOYD,
Caywood, N. Y.

UNITED STATES DEPARTMENT OF AGRICULTURE

Bureau of Markets

Honey Arrivals Since Last Report

Medina O.: 2,180 pounds Michigan, 1,898 pounds Florida.

Shipping Point Information

San Francisco: Too few sales to establish market.

Los Angeles: Warm, clear. Supplies very light and practically all held by exchange. Demand slow; no sales reported.

Note: Arrivals include receipts during preceding two weeks. Prices represent current quotations.

Cincinnati: No carlot arrivals. Supplies heavy. Practically no demand or movement; no sales reported. Beeswax: Demand and movement moderate; market steady. Sales to jobbers—pure wax, dark to light, 40-44c per pound.

Kansas City: 1 Colorado and approximately 50 packages freight arrived. Supplies moderate. Demand slow, movement draggy. Sales to jobbers—Comb: 24-section flat cases, Colorado No. 1 light, $7.25; Missouris, $8.00-8.50. Extracted—Colorado, 60-lb. cans, 20-22c per pound. Beeswax: 35-40c per pound.

Chicago: No carlot arrivals, but liberal receipts from Illinois, Idaho, Colorado, California and Wisconsin in small lots. Demand and movement good for extracted; demand and movement slow for comb. Sales to Jobbers—Extracted: per pound, all sections, white 20-22c, light amber 19-21c. Comb: 24-section cases, Western No. 1, $6.50-7.00; dark broken, $4.50 up. Beeswax: Demand and movement moderate, light 45-50c; dark 40-43c per pound.

Cleveland: No demand. No jobbing sales.

Denver: Receipts very light. Demand and movement very slow. Sales to jobbers—Extracted: White, 19c per pound. Beeswax: Cash to producer: Light, 38c per pound.

Minneapolis: Supplies liberal. Demand and movement slow. Sales direct to retailers—Comb: Little change in prices; fancy western white, $7.50-8.00 per case. Extracted: Prices lower. Western, 60-lb. cans, fancy, 20-23c per pound.

New York: Arrivals, 395 barrels West Indies, 1,140 cases Central America, 80 barrels South Pacific ports. Exported: 590 barrels, 445 cases to France; 500 cases to England, 2,680 cases to Sweden, 600 cases to Denmark. Demand slow, few sales to jobbers—Porto Rican and Cuban, $1.85-2 per gallon. New York, per lb., buckwheat 12-16c, clover 18-20c. Beeswax: Arrivals, 200 bags, 79 seroons, 27 cases West Indies; 168 bags South America. Exported: 60 bags to Sweden. Demand and movement slow, market weaker. Per pound, dark 35-37c, light 38-39c.

Philadelphia: No receipts. Demand and movement very light, practically no movement; very few sales. Sales direct to retailers: Comb—California 30-32c per pound. New Yorks, $5.50-6.00 per 24-section case.

St. Louis: Supplies light. Demand and movement slow. Sales to jobbers—very few sales. Southern Extracted, per pound in barrels, 18c; in cans, 20c. Comb; Practically no supplies on market. No sales reported. Beeswax: Prime 35c per pound.

St. Paul: Supplies liberal. Demand and movement slow; very few sales. Sales direct to retailers: Comb—Western fancy white, $7.50 per case. Extracted: Western, 60-lb. cans, fancy, 25-28c per pound.

Telescoping Covers

For some time I have made my own telescoping covers and under covers for my hives from store boxes. I get some pieces 2 inches wide by seven-eighths inch thick sawed out at the mill and cut them three-quarters of an inch longer than the width of hives. I cover them with three-eighths or half-inch lumber from the store boxes. Then I cover them with asphalt roofing, reaching down over the 2-inch sides of covers.

I give them a coat of asphalt paint every year or two in early spring and leave them out in the weather to dry

D. F. Rankin, painting double covers.

some time before I take my bees out of winter cases.

I find my combs never melt down under such covers and my bees are all without any other shade.

Enclosed is a picture taken when I was painting the covers.

D. F. RANKIN
Brownstown, Indiana.

A Missouri Association

On March 13 the Chariton County Beekeepers' Association was organized at Brunswick, Mo. The following were elected as officers:

President—W. L. Williams.
Vice President—Dr. W. D. West.
Secretary-Treasurer—H. E. Bartz.

Prolific Bees

Thirty-five years ago, when I was 17 years old, I secured a swarm of bees which were the gentlest and best honey-getters I ever saw. I made a hive of about eight frames, but about 30 inches long, three stories and a super. The first year I got about 300 pounds of the whitest and finest honey. After that from 30 to 100 pounds, with never a failure in the poorest seasons. They were larger than the largest Italians I ever saw,

very hairy and of a silvery-light color, glistening in the sun. My question is, what kind of bees were they? SYLVESTER KALER,
Arkansas City, Ark.

High Prices in Denmark

The honey harvest this year was nearly a failure most places in Denmark. The island of Bornholm was one of the best, here it was about average. I got 300 pounds less than last year, but the price was so high that the increase this year was more than last. The price was fixed by the government at 67 cents per pound, or 23 cents higher than in 1917. If there had been no fixed price it would have gone away in the wild, as the demand was very great. For wax we were offered $2.50 per pound, but now the price is fixed at about 90 cents, which is too low, so no wax will be sold. Thank God the war is over. ANNA SOMMER,
Lobbek Bornholm, Dénmark.

Introducing Virgin Queens

Referring to page 17, January American Bee Journal, article written by Dr. Miller, "Care of Virgin Queens."

Having had much experience along this line for the past 18 years, I will give my plan of introducing week-old virgin queens taken from a nursery cage.

Take a cage same as used for shipping a pound package of bees, cage bees in these the exact amount in each cage desired to form the nucleus. Leave them caged from 10 to 14 hours or over night without food. Then sprinkle heavy next morning with sugar syrup; at the same time dip the virgin queen in syrup and let her loose in the package; turn the package first one way and then the other, mixing the bees all up. Don't be afraid you will hurt them; give them a good shake. Leave them for one hour, or, better still, if they are to be taken any distance to outyards, load into truck and take to locations where the nuclei have been prepared to receive them. Upon arriving, if they have cleaned themselves up pretty well, sprinkle again with syrup; then dump the whole bunch into the prepared nuclei, which should contain some empty combs, so they may have a place to store a portion of the syrup now in their honey-sacs.

There should be no brood in the nuclei, only empty combs. I remember once of introducing 450 old virgins in this way, and 14 days later caged 412 fine laying queens.

This is the most successful plan I have ever used, after trying many different ones the past years.

Should these week-old virgins be introduced to full colonies or old formed nuclei which have been queenless 3 or more days, I would cage all the old bees out of these that I thought they could spare over night, not to weaken them so as to lose their brood; leave these caged in same manner over night, and treat them as before, with syrup; loose the virgin from hatching cage, dip her in syrup and run into the cage; then take these back to the colony from which they came; and the plan works better than any I have ever used. In other words. it's about the only way a virgin can be successfully introduced.

It seems as though the bees, after having been confined for so long without food and then sprinkled heavily with food, have so much to be thankful for that they gladly accept the virgin and never think of picking a scrap with her, and after remaining an hour or so with the bees in this manner she becomes one of the bunch, and they can better be united to their original colony.
WM. ATCHLEY, Ontario, Calif.

Temper in Bees

In 1916 I purchased a Cyprian queen. In 1917 I grafted 10 cell-cups from the Cyprian queen and got 7 laying queens. These were mated to the golden drones in my yard, and in temper were about like the average of the yard. That is, you really don't need a smoker.

Ten virgins just hatched were chosen for a mating experiment. They all looked alike and all were hatched within 4 hours from first to last. The excluder zinc was closed on all 10 entrances till on the fifth day. All drones were confined to their hives except those of the Cyprian queen. Then 5 excluders were opened, these 5 mated on or before evening of the ninth day; the excluders were now closed on these, a drone trap placed on hive of Cyprian queen. The other 5 excluders were opened and also the excluders from my colonies of Golden drones. One queen was lost, the other four were O. K.. Results: These 4 queen bees were about like the average in the yard as to temper; the other 5 queen bees were alike, and if such were possible, were crosser than those of the Cyprian queen.

I now mated a virgin from my breeding queen to the drones of one of those queens crossed with Cyprian drones, and in temper these bees were equally as cross. We can't be too careful of our drones in mating queens. Some day the old theory will be shattered that the drone is not affected by the mating of the queen. If you wish to change the ways and temper of your bees look to your drones. My conditions here are ideal for such experiments. I had less than 1 per cent mismated queens in 1918.

D. L. SWARTS,
Lancaster, Ohio.

Parthenogenesis

I am sending you a clipping containing an article by W. E. Joor, President of the Dallas County Beekeepers' Association, in which he says that the queen lays eggs in drone-cells that produce drones. Is this correct?

What I know about bees I have learned directly from the bees, and I have seen worker-bees lay eggs in drone-cells and I know that these hatched as drones. I have had this to happen many times in queenless hives. So I have concluded that the worker-bees lay the drone eggs and the queen lays the eggs that hatch as workers or queens. Let me know whether I am right. W. H. M.
Texas.

Answer. You and Mr. Joor are both right. He is right in his assertion that the queen can and does lay drone eggs in drone cells and you are right in saying that workers—some of them, at least—can lay eggs that will hatch as drones.

The ability of the queen to lay both worker and drone eggs is similar to that of any other perfect female. But she has another ability which pertains only to a few insects, and that is to lay eggs which will hatch into living insects without having been fertilized at all. This peculiarity is called "parthenogenesis." It is as follows:

The queen has, alongside of the duct or canal through which the eggs pass, a small sac which is called the "spermatheca," and in which the fecundating liquid from fertilization is kept. When the egg passes by that sac, if a slight pressure is exerted, the egg is fertilized and becomes a female, queen, or worker. If the pressure is not exerted, the egg passes without being fertilized, but it nevertheless hatches and produces a male or drone. The worker bees, never having been fertilized, may nevertheless lay some eggs, and these also hatch as drones. It is only in queenless colonies that you will find laying-workers, and whether their eggs are laid in drone cells or in worker cells, they invariably hatch as drones.

The same thing happens with a queen which has been confined to the hive during the first month or so of her life, so that she cannot mate. After that lapse of time she loses all desire to mate and begins to lay eggs. But as she has not been impregnated, all her eggs hatch as drones.

These are facts which have been proven over and over. You will find them mentioned in "The Hive and Honey Bee' revision, pages 55 to 62. or in shorter description in "First Lessons in Beekeeping," pages 3 and 4. In fact, almost any work on bees mentions this "parthenogenesis," which is a very interesting peculiarity of the honeybee.—C. P. D.

Spraying Again

I have just been reading the article in your journal in regard to prohibiting spraying while the trees are in bloom.

The writer seems to think that laws are not just what are needed. Why not require manufacturers of spray poisons to print the necessary information on the labels of poison containers? It will then be where it is needed at the right time, and the average person will pay more attention to it than to the same thing in a circular that he probably received two or three months before and had time to forget.

WM. C. KELSEY,
Orland, Ill.

Crop and Market Report

Compiled by M. G. Dadant

The winter loss has been extremely small, comparatively all over the country the past year, being as low as a fraction of 1 per cent, and only as high in extreme instances as 12 per cent.

Throughout the Eastern States, the South and the Central West, the losses have averaged from 2 to 3 per cent, with only an occasional reporter turning in 10 per cent.

It is surprising to note that the largest losses were in the States of Colorado and New Mexico, where the average was probably from 7 to 8 per cent, and many reporters stated that the losses were as high as 12 per cent.

There is also, in some instances, large loss reported in California, mostly due to insufficient stores in the fall. Other reporters in the same locality, whose bees had gone into winter with a quantity of stores, came through in excellent shape.

CONDITION OF COLONIES

In practically all of the East, Central West and Southeast, and more especially in Texas, colonies are coming through in excellent condition. They are, as a rule, very strong in bees and the only criticism is that they may be short of stores, this probably due more to their not having been given sufficient stores in the fall than to extreme use of stores during the winter.

CROP PROSPECTS

Very probably in all the East and Central West, prospects are not above average. Conditions seem to be especially favorable in the New England States and in sections of New York, Pennsylvania, and Ohio. The southern half of Illinois, Indiana and all of Missouri seem to be much below normal, while sections of Iowa report the clover burned out last summer, and no prospects ahead.

The northern half of Illinois seems to be better, as does the northern part of Iowa, and conditions in Michigan are very favorable.

In Wisconsin, the clover seems to have been burned out last year, and prospects are not especially flattering, although some reporters claim that good spring rains will bring a fair crop.

In Minnesota, and the Dakotas, the prospects are average, or possibly a little lower. Kansas and Nebraska have fair prospects. Sweet clover prospects in the Missouri valley are excellent.

In the whole Southeast, the prospects seem to be at least normal, and in Texas conditions are especially favorable. They state that they expect a better crop than for several years.

It is too early to give any indication of crop prospects in the inter-mountain States, although they seem to be about normal.

The orange flow in California seems to be at least as good as average, while the conditions with the sage and alfalfa hardly seem to be up to normal.

INCREASE FOR 1919

Practically 90 per cent of the reports state that increase will be made, and this increase varies from 20 to 100 per cent. Localities expecting to make the least increase are those which experienced a short crop last year, with unfavorable conditions for 1919. In the Eastern States the increase will be from 20 to 50 per cent, whereas in the Central West it will only range from 5 to 15 per cent.

In the Western States many of the larger producers expect to increase about 10 to 25 per cent, with only a few holding off with their present number of colonies owing to the expectations of a drop in prices of honey.

HONEY DEMAND AND PRICES

Contrary to our prediction in the crop and market page for January, there remains considerable honey on hand, and much of it will probably be carried over until the new crop is harvested.

Practically all of this honey, however, is in the hands of the dealers, only a small percentage of our reporters claiming any large amount on hand.

Practically every reporter states that honey is in poor demand, and this is re-echoed by the dealers who are having very few calls for honey, and these from the regular users who were in the habit of buying honey regularly.

The outlook, therefore, for the supply of honey now on hand is in foreign markets. There is some satisfaction in the statement of the Bureau of Foreign and Domestic Commerce that there was sold during February to foreign buyers, almost 2½ million pounds of honey, as against 1½ million pounds during the same period in 1918. This goes to show that the foreign buyers are taking honey freely, although, of course, they are getting it at a much less figure than during the previous year. The large exports are probably due both to the lower price and to the facility with which export permits are issued for foreign shipments. Then, too, the rate of freight and insurance has dropped a great deal, making the freight costs very much less than they were during last February.

All markets are bare of comb honey at present and one big distributing house states that they could dispose of several cars if it were to be had.

With the large number of beekeepers now producing extracted honey, we would not recommend discarding comb honey equipment for extracted. In fact, prices of the two may not compare unfavorably for the comb honey producer during the coming year.

CLASSIFIED DEPARTMENT.

Advertisements in this department will be inserted at 15 cents per line, with no discounts of any kind. Notices here cannot be less than two lines. If wanted in this department, you must say so when ordering.

BEES AND QUEENS

"SHE SUITS ME" Italian queens, $1.15 each from May 15 to October 15; 10 or more, $1 each. Allen Latham, Norwichtown, Conn

CLOVER and heartsease honey, fine flavor, in new 60-lb. cans, at 23c.
Edw. A. Winkler, Joliet, Ill.

FOR SALE—Apiary of 100 strong colonies equipped for xtracted honey, fine location; 500 full-depth supers, 100 shallow supers, 120-acre homestead, relinquishment goes with the bees; everything new and in fine condition. If interested, write for complete list and price.
J. B. Douglas, Box 1085, Tucson, Ariz.

FOR SALE—Hardy Italian queens, 1, $1; 10, $8. W. G. Lauver, Middletown, Pa., R. 3.

FOR SALE—Goldens, untested, 1, $1.25; 6, $6.50; 12, $11.50. S. A. Tyler, Emden, Ill.

FOR SALE—1 2-lb. package of bees with a 3-banded Italian queen, for $5.
J. L. Leath, Corinth, Miss.

I. F. MILLER'S STRAIN Italian Queen Bees for sale. Now booking orders for early delivery. By return mail after June 15, or your money back. Northern bred, for business, from my best superior breeders; gentle, roll honey in, hardy, winter well, not inclined to swarm; leather color or 3-banded. Queens a specialty; 25 years' breeding experience. Safe arrival and satisfaction guaranteed. Untested, $1; 6, $5.50; 12, $10. Select untested, $1.25; 6, $6.75; 12, $12.
I. F. Miller, Brookville, Pa., R. R. No. 2.

FOR SALE—One of the best queen breeders in the United States is now raising queens for us from selected stock of leather-colored Italians. We offer warranted queens at $1 each, or $90 per hundred. Tested queens $2 each. Satisfaction and safe delivery guaranteed. Queens ready May 25. Order now, as our supply is limited.
The Foster Honey & Mercantile Co.,
Boulder, Colo.

THE EDSON APIARIES will have a surplus of A No. 1 laying Italian queens after May 1, leather colored or goldens; prices reasonable. Address Edson Apiaries prior to June 1, Biggs, Calif. After June 1, West Butte, Calif.

QUEENS—Bees by the pound, 3-banded and golden. They are hustlers, gentle to handle, cap their honey white, are very resistant to European foulbrood. Booking orders now one-fourth down, balance at shipping time. See January "ad" for prices on bees by the pound. Quote nuclei f. o. b. here, 2-frame nuclei, $4.50; 3-frame nuclei, $6; 1-frame nuclei with 1 lb. extra bees, $4.50; 1-frame nuclei with 2 lbs. extra bees, $6; 2-frame nuclei with 1 lb. extra bees, $6. No discount on nuclei. Select untested queens, $1.50 each; 25 or more, $1.35 each. Tested queens, $2.50. Select tested, $3. Free circular giving details.
Nueces County Apiaries, Calallen Texas.
E. B. Ault, Prop.

FOR SALE—For spring delivery—Colonies of Italian bees fine strain, with tested queen, in 1-story 8-frame single-wall hives, full depth, self-spaced, Hoffman frames, nearly all wired, $10 each. A few colonies in 10-frame hives, $11 each; all free from disease; f. o. b. here.
Wilmer Clarke, Earlville, Mad. Co., N. Y.

FOR SALE—150 colonies of bees in Iowa, mostly Italians. One 4 and two 2-frame extractors, storage tanks, empty hives and supplies, in good condition; will sell as one lot, or part No disease. Reason for sale, leaving the State. F. Eric Millen,
State Apiarist, Ames, Iowa.

THREE-BANDED ITALIANS ONLY — Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. H. G. Dunn,
The Willows, San Jose, Calif.

GOLDENS that are true to name. Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. Garden City Apiaries,
San Jose, Calif.

FOR SALE—Bright Italian queens, $1 each; $10 per doz. Ready April 1. Safe arrival guaranteed.
T. J. Talley, R. 4, Greenville, Ala.

BEES AND QUEENS—When you can't get them from others you can from us. 1 lb. package, $2; 2-lb. package, $3.75 Queens, $1 each, $11 per doz. Good stock; no disease; order quick. Special prices on nuclei.
Pelican Apiary, New Orleans, La.

Head your colonies with Simmons' Famous Italian Queens. They took first premium at New York State Fair last September. Goldens or three-bands: 1, $1.50; 6, $7.50: 25, $30. Orders booked now and filled in rotation. Also nucleus from same stock ready for June delivery. Allen R Simmons,
Fairmount Apiary, Claverack, N. Y.

J. B. BROCKWELL'S Golden Queens, untested, May, June and July, $2 each; six, $7.50; doz., $14; tested, $4 each. Breeders, $5 to $20 each; 3-f. nuclei with tested queen, $9.
Barnetts, Va.

GOLDENS—When you get tired being stung try one of these; tested, $2; untested, $1.
Honeysuckle Apiaries, R. F. D. 1 Box 208,
Fort Smith, Ark.

GOLDEN ITALIAN QUEENS — No better honey gatherers anywhere at any price Untested, $1; tested, $2.
Wallace R. Beaver, Lincoln, Ill.

FOR SALE—3-band Italian queens ready June 1. Untested, each $1; twelve, $10; 100, $80. No disease here and satisfaction guaranteed. A. E. Crandall & Son,
Berlin, Conn.

LEATHER and all dark colored Italian queens, when we have them, mated, $1 each. These queens will include all that are not up to the standard in our goldens, but will be good utility stock. C. W Phelps & Son,
No. 3 Wilcox St. Binghamton, N. Y.

SWARTS GOLDEN QUEENS produce golden bees of the highest quality; satisfaction guaranteed. Mated, $1, 6 for $5; tested, $2.
D L Swarts, Lancaster, O., Rt. 2.

FOR SALE—3-band Italian queens from best honey-gathering strains obtainable. Untested queens, $1.25 each; 6, $6.50; 12, $11. Satisfaction guaranteed. W. T. Perdue,
Route No. 1, Fort Deposit, Ala.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you desire. They are great honey gatherers, beautiful and gentle. Virgin, $1; mated, $2. C. W. Phelps & Son,
3 Wilcox St., Binghamton, N. Y.

QUEENS FOR SALE—Quirin's hardy northern bred Italians will please you. All our yards are wintered on summer stands. Tested and breeders ready any time weather permits mailing. Untested about June 1. Orders booked now. Testimonials and price list for asking. Have been a commercial queen-breeder for more than 25 years.
H. G. Quirin, Bellevue, Ohio.

OUR BRIGHT ITALIAN QUEENS will be ready for shipment after April 15. Untested, 75c each; half doz., $4.50, or $8 per doz. Select untested, 90c each; half doz., $5.50, or $10 per doz. Tested, $1.50 each. Safe arrival guaranteed.
Tillery Bros., R. 5, Box 1D, Georgiana, Ala.

QUEENS—3-banded Italians, from best stock; untested queens in April, May and June, one, $1; twelve for $10. Tested, $1.50 each; if you want as many as 50 queens, write for prices and discounts on early orders; no disease. Safe arrival and satisfaction guaranteed. O. D. Rivers,
Route 4, Honey Grove, Texas.

QUEENS from one of Dr. Miller's breeders, tested, $1.75 each, $18 per doz; untested, $1.25 each, $13 per doz.; 1 frame nucleus, $3, 2 frames $5, 3 frames $6.50 each, without queens. We have never had any disease here. Safe arrival and satisfaction guaranteed. We have no package bees to offer, and no untested queens, except with nuclei. Delivery April 15.
Geo. A. Hummer & Sons.
Prairie Point, Miss.

WANTED—Bees in lots of 5 to 50 or more colonies. J. F. Coyle, Penfield, Ill.

FOR SALE—Leather-colored Italian queens, tested, to June 1, $2; after $1.50; untested, $1; $10 per dozen. A. W. Yates,
15 Chapman St., Hartford, Conn.

GOLDEN ITALIAN QUEENS and bees; honey-getters, prolific and gentle. Bees by the pound. Write for prices.
J. W. Rice, Box 64, Fort Smith, Ark.

BEES AND QUEENS from my New Jersey apiary. J. H. M. Cook,
1Atf 84 Cortland St., New York City.

FOR SALE—Pure 3-banded Italian queens, as good as you can buy with money, from June 1 to September 1.
J. F. Diemer, Liberty, Mo.

BEES AND QUEENS—If the other other fellow has disappointed you by booking more orders than he could fill, let us know your needs at once; perhaps I may be able to help you out yet for this season. I am making a special rate on queens in quantities..
George W. Brown, Lynnhurst Apiary,
Wilson, Wis.

FOR SALE

FOR SALE OR EXCHANGE—One Hatch wax press; also one Barnes foot-power saw.
Frank Hoopes, East Downington, Penn.

FOR SALE—40 colonies of Italian bees in 8-frame factory hives, Hoffman frames. Price, $8 per colony, f. o. b. here.
D. G. Little, Hartley, Iowa.

FOR SALE—Bee hives, supers, sections, smokers, bee veils. Foundation and bee books illustrated. Catalog for stamp.
J. J. Fitzgerald, Mitchell, S. D.

FOR SALE—Bees, 1-lb, $2; 2-lbs, $3.75; 3-lbs., $5.50; 3-banded queens, untested, $1.25; tested, $2 each Deliveries of pound packages from April 20 to May 20; queens until July 1.
Elevation Apiaries, Milano, Texas.

FOR SALE—Clover and buckwheat honey in any style container (glass or tin). Let us quote you. The Deroy Taylor Co.,
Newark, N. Y.

FOR SALE—A limited number of bees and queens for May delivery from either home apiaries or South Carolina; safe delivery guaranteed if shipped by express. Parcels post shipments at buyer's risk. We invite correspondence as to details and price.
The Deroy Taylor Co., Newark, N. Y.

HATCHING EGGS—Plymouth Rocks, all varieties; Anconas and Rouen ducks. Illustrated catalog 3c.
Sheridan Poultry Yards,
R. 13, Sheridan, Mich.

FOR SALE—Frame nailing device. You can make very satisfactory and simple device. Send 50c for drawings showing construction and operation for nailing Hoffman frames; use idea for nailing any style of frame.
Clarence Aldrich, Santa Barbara, Calif.

FOR SALE—Cedar or pine dove-tailed hives; also full line of supplies, including Dadant's foundation. Write for catalog.
A. E. Burdick, Sunnyside, Wash

FOR SALE—40,000 pounds of No. 1 extracted clover honey and 35,000 pounds of aster honey; both of extra light color, heavy body and fine flavor, in 60-lb. cans.
W. B. Wallin, Brooksville, Ky.

FOR SALE—25 10-frame hives, never been used, full sheets foundation.
30 lbs. foundation brood and surplus.
15 feeders.
70 10-frame queen excluders.
100 comb supers, 10-frame.
2,500 sections, 4¼x4¼x1⅞.
Five to six hundred extracting supers, with combs; no disease. E. Keister, Clarno, Wis.

FOR SALE—Silver Spangled Hamburg eggs and fine, rare old Paganini violin for sale.
Elias Fox, Union Center, Wis.

FOR SALE—40 8-frame zinc and wood queen excluders, 25c each; 10-frame wire excluders, new style, 50c each.
D. G. Little, Hartley, Iowa.

FOR SALE—Due to my time being taken up with professional work this spring, I have more bees than I can take care of properly. If in the market for good colonies of bees, please address, J. F. Coyle, Penfield, Ill.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
Superior Honey Co., Ogden, Utah.

FOR SALE—Golden Italian queens of quality, 1, $1.25; 6, $6; 12, $11. Satisfaction guaranteed. L. J. Pfieffer,
Route A, Los Gatos, Cal.

FOR SALE—Good second-hand empty comb-honey double-deck shipping cases for 4¼x1⅛ sections, good condition, at 25 cents apiece, f. o. b. Cincinnati.
C. H. W. Weber & Co., Cincinnati, O.

FOR SALE—Photos of L. L. Langstroth, inventor of movable-frame hives, size 7x9; price, $1. American Bee Journal,
Hamilton, Ill.

FOR SALE—5 10-frame hives drawn combs on foundation.
1 8-frame hive drawn combs on foundation.
2 10-frame hives with frames, foundation, wired, one empty.
14 10-frame supers, inside fixtures, except two.
3 8-frame supers, inside fixtures.
10 10-frame supers, 5 in each lot, inside fixtures, not unpacked.
All in first-class condition. No disease.
P. H. Dunn, Akron, Iowa.

FOR SALE—Extracting outfit, 150 colonies bees, New Republic special truck, and location. Frank F. France, Platteville, Wis.

FOR SALE—8-frame Hive Parts.

149	Brood chambers, empty	75c each
99	Extracting supers, empty	45c each
154	Bottom boards	50c each
49	Metal-roofed covers	90c each
100	Wood-zinc queen excluders	30c each
36	Escape boards, with escapes	25c each
50	Wood and 7-wire honey-boards	60c each
27	Extracting supers ½ depth, with combs	$1.75 each
38	Extracting supers, ½ depth, empty 10-Frame Hive Parts.	35c each
32	½ depth extracting supers, with combs	$1.80 each
23	Comb-honey supers, 7 to foot sections	75c each
21	Excelsior covers	50c each
21	Bottom boards	40c each
21	Brood chambers, empty	60c each
21	Wood-zinc honey-boards	25c each
20	Old style 2-story extracting hives, empty	$1.00 each

W. C. Lyman, Downers Grove, Ill.

FOR SALE—Golden Italian queens which produce gentle, yellow bees, the hardest workers we have known, $2.50 each. When you wish to improve your stock always buy the very best. Wild Flower Apiaries,
Southern Bldg., Little Rock, Ark.

FOR SALE — Friction feed, 20-inch planer; good as new. F. E. Gregory,
849 Ellis Ave, Ottumwa. Iowa.

SPECIAL SALE—1-story 8-frame dovetailed hives in flat, with telescope ⅞ wood covers, in packages of 5, at $10 per package.
A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—75 Lewis 24-lb. shipping cases at $8 per 25; 500 No. 1 Lewis sections, 4¼x4¼x1⅞ beeway at $4; one No. 15 extractor, $20; 1 Dadant uncapping can, $12; 10-oz. round screw-cap honey jars in 2-doz. reshipping cases, at $1 per case; either plain or beeway 10-frame painted supers filled with sections and full sheets, at $2 each; 8-frame at $1.80; without sections, at $1.10 and $1; 1,000 fence separators at $2.25 per 100; 2,000 slotted separators, $1 per 100; plain or slotted holders, $2 per 100; 100 division-boards at 5c each.
Edw. A. Winkler, Joliet, Ill.

FOR SALE—75 queen-mating hives, with half-size L. frames; part with combs and part with full sheets of foundation, and some empty frames. Will sell cheap. Write for photos and particulars. Have never had foulbrood.
D. G. Little, Hartley, Iowa.

AMERICAN BEE JOURNAL

VOL. LIX—NO. 6 HAMILTON, ILL., JUNE, 1919 MONTHLY, $1.00 A YEAR

SWARM CONTROL IN THE PRODUCTION OF EXTRACTED HONEY

By C. P. Dadant.

WITHOUT doubt it is easier to control swarming when producing extracted honey than with comb-honey production.

We do not like to bother with any of the remedies offered for preventing swarms after the bees have shown a disposition to rear queen-cells. We prefer to forestall the tendency to the rearing of queen-cells. This may not always be done. Yet in an experience of some 50 years, we find that not over 5 per cent of the colonies run for extracted honey will swarm if the proper requirements are understood and provided.

Although swarming is a natural act in the cycle of a colony's existence, it is induced by causes which are mainly under the control of the apiarist.

Lack of room, decrease in the opportunities for ventilation in hot weather, increase in the temperature of the bee-hive to the danger point, overcrowding of bees, desire to rear young queens to replace a possibly failing mother, these are the main inducements to swarming.

When we speak of lack of room we must think of it in two ways: lack of breeding room for the queen, lack of storage room for the incoming honey.

From these two points we determine that we cannot prevent swarming unless the brood-chamber contains a sufficient number of cells to accommodate the egg-laying power of the queen as well as to store the pollen and honey necessary to the sustenance of the hatching larvæ. Neither could we succeed in preventing it, if, the supers being insufficient in space for honey, the bees were compelled to place the fresh-gathered honey in the brood-chamber as fast as young bees hatch out.

So we must have both a large brood-chamber and large supers. The latter must not consist simply of empty frames with strips of foundation guides. A sudden honey flow, coming before the bees have had time to produce wax to build comb, would give every bee an opportunity to fill herself with honey, without room to unload this honey, and a swarming fever would quickly be the result. So we must try to provide, beforehand, a large number of empty combs in our supers and place them over the brood-chamber before the bees feel the need of them.

Decrease in the opportunities for ventilation.—A the hive becomes more fully populated, young bees hatch daily by thousands, and the workers go back and forth through the entrance in constantly increasing numbers, the opportunities for ventilation decrease. We should not forget that each colony, in warm weather, must send a current of air through the brood-combs to the remotest part of the upper story and back and out again, in order to properly ventilate. As the population increases, we increase the space available for ventilation, by raising the hive from its bottom, in front, as much as necessary to make the colony comfortable. This may require a space of from half an inch to three inches. It is even sometimes necessary to "stagger" the supers, placing them back or forth slightly, so as to leave an opening of a quarter inch or more, between them and the body of the hive. This method is to be resorted to only when the lower ventilation is deemed insufficient. We must be sure that our bees are **not** idle for lack of plenty of room or ventilation.

Touching the subject of ventilation, it becomes more and more evident to me that the spacing of combs one-and a-half inches from center to center, is one of the best helps for the prevention of swarming, as compared to the one-and-three-eighths spacing existing in most of the factory-made hives. This spacing not only gives an additional amount of clustering space for the bees, but increases the facilities for ventilation, without any disadvantages whatever. At least, since I have championed the wider spacing as necessary, I have found no valid objections to its use. The addition of some 150 cubic inches of breathing and clustering space, between ten combs of brood in a hive, is an important matter.

The overcrowding of bees is greatly increased when a colony is permitted to produce a large number of drones. The drones are in the way, remaining clustered in the brood-chamber at all hours, except during the warm part of the day, at the time when the workers are busiest going back and forth, when they, also, take flight and annoy them with their activity. In some hives, where the apiarist has failed to control their production, one may find as many as 2,000 or more of these idlers, who consume honey and get in the way of the workers. It is a loss in every way to permit them to be reared. Better cut out the drone-comb in early spring and replace it with worker comb. The bees will always manage to rear a hundred or two of the drones in out-of-the-way corners, but so small a number will not be objectionable.

In our hot countries, in order to prevent the increase of heat to the danger point, it is also necessary to shelter the hives from the heat of the sun. In northern climes, where the sun's rays are more oblique, this matter is of less importance. But at the latitude of our own location, which is the same as that of Naples, Italy, or of Madrid, Spain, and at low altitude, it is almost indispensable, if we wish our bees to feel com-

fortable, to have our colonies well shaded from the sun, whether under trees or under a roof, or both.

The last, and one of the most important requirements for the prevention of swarming, is a young queen, so that she may not indicate, by her decrease of laying during the active season, that she is failing in her ability to sustain the strength of the colony. The entire force of a hive depends upon her, since she is the mother. If she should fail, leaving no other fully developed female to take her place, the hive would be doomed to destruction. It is therefore very conceivable that the bees should show great anxiety and foresight upon this matter. Whenever she decreases her activity in laying, at the season of high breeding, the bees prepare to replace her, by building queen-cells. This angers her, if she is still sufficiently active to resent it, and she soon leaves with a swarm. When all other contingencies have been provided for, this is the most common cause of the production of swarms.

Many beekeepers, who wish to keep active queens in their colonies, replace the queens of all the colonies annually. Personally, I believe this is unnecessary. Many queens are better in their second year than in the first. Many are just as good. If we take in consideration the cost of new queens, the chances of securing a poorer queen than the one which we know to be good in a colony, we will conclude that is is well to give our **good** queens a two-years' lease. I emphasize the words "good queens," for if we have poor queens, we cannot replace them any too soon.

The replacing of the queens at least every two years will insure us against much queen-cell building for superseding queens.

The reader will take notice of the fact that the foregoing requirements for the prevention of swarming do not require much labor at swarming time. We replace our queens in early spring, and the only requirements in the busy season are such as are necessary under any conditions, giving more ventilation, more supers.

If, however, the beekeeper wishes to entirely prevent swarming, he may go to the trouble of examining the colonies inside, from time to time, and if any swarming preparations are under way he may employ any one of the numerous methods recommended for interfering with natural swarming, even to making forced swarms or removing the queens and all the cells but one. If the above-given methods are followed, in the production of extracted honey, very few swarms need be expected.

Control of Swarming With Comb Honey

By C. C. Miller

IF one were undecided whether to work for extracted or comb honey, the scales might be turned in favor of extracted upon thinking that it is easier to prevent swarming when working for extracted honey, and that if swarming does occur the effect upon the crop of comb honey may be almost disastrous while making much less difference upon a crop of extracted honey.

Of course, some of the things that help to control swarming are the same, no matter what kind of honey is produced, such as shade for hives, large brood-chambers, spacing combs an inch and a half from center to center, suppression of drones by having all worker-comb, etc. In some things, however, you cannot work the same.

Take ventilation. Make a large opening between two extracting supers, and although you may stop all storing near that opening, it need not make a crop less, for the honey will be stored elsewhere. Do the same thing with section-supers, and you have a lot of unfinished sections on your hands. And yet ventilation is very important when producing sections. At the bottom of the hive there is the same opportunity for ventilation as with extracted honey. The entrance can be large, the hive may be raised on blocks at the corners, or the bottom-board may be 2 inches deep, with a bottom-rack to prevent the bees from building down. But if any opening be made above the brood-chamber, the cold air entering at that point will interfere somewhat with storing there, and very much with sealing.

Yet ventilation is such an important factor in the control of swarming that the good resulting from it overbalances the harm. The super that sits on the hive should be shoved forward so as to make a space of a quarter of an inch or more between hive and super at the back end. That will hinder storing and finishing in the lower super and in one or two next above, yet I have known it the case in a hot spell for these rear sections to be finished more readily than the sections in the middle of the super.

Master Tenaka Kurihara Ishida's unappeased appetite for honey

I never tried making ventilation-spaces between supers, but I have tried having an opening over the top super over the central sections. First is a thin cover over the super having an opening in its center 5 or 6 inches square. On each end of this lies a strip three-eighths thick, and on this is placed the regular cover. That, you will see, leaves an opening of three-eighths of an inch for the air to pass through between the two covers.

I cannot speak very definitely as to the effect of this top ventilation, not having given it much trial, for soon after devising it I changed from section honey to extracted honey. But I regard it hopefully.

Whether all these things have been done or not, suppose a colony takes it into its head to swarm, what is to be done to head it off? To get advance information upon the subject it is indispensable to look inside the hive. If no queen-cells are started there is no thought of swarming. A little before the time when swarming is likely to begin, if we find no cells started in a number of the strongest colonies, it is hardly worth while to look through the rest of the apiary. A second examination is made perhaps ten days later, and at intervals of 10 days thereafter. Whenever queen-cells are found they are destroyed. After cells are once destroyed, it will happen in rare cases that they will not be started again. Generally, however, cells will be found upon the next inspection. If only eggs or young larvæ are found in them, they are destroyed, and in some cases this may continue throughout the season. Indeed, there may be colonies that never start a cell all summer. But if big larvæ are found in the cells, pretty well filling them, that may be considered as due notice that the bees will no longer brook any trifling, but will swarm before another ten days if vigorous measures are not taken.

At this point a swarm may be shaken, as it is called, which consists in taking away all but one brood. This leaves the colony practically in the same condition as if a natural swarm had issued. It has, however, the advantage that all the bees may be left on the old stand, making it stronger for storing. Of course, if increase is wanted, enough bees may be taken with the brood to take care of it, and being set upon a new stand, a new colony may be started, which will be in the same condition as the mother colony when a natural swarm has issued. This plan of shaking a swarm is an advisable proceeding when increase is desired, or when the brood that is taken away can be used with profit elsewhere, but if we want all the bees and all the brood to remain with the old colony, then a different course must be taken.

The Demaree plan, putting all but one brood above an excluder, is barred out for comb honey, the brood-combs put above the excluder becoming extracting-combs, and we

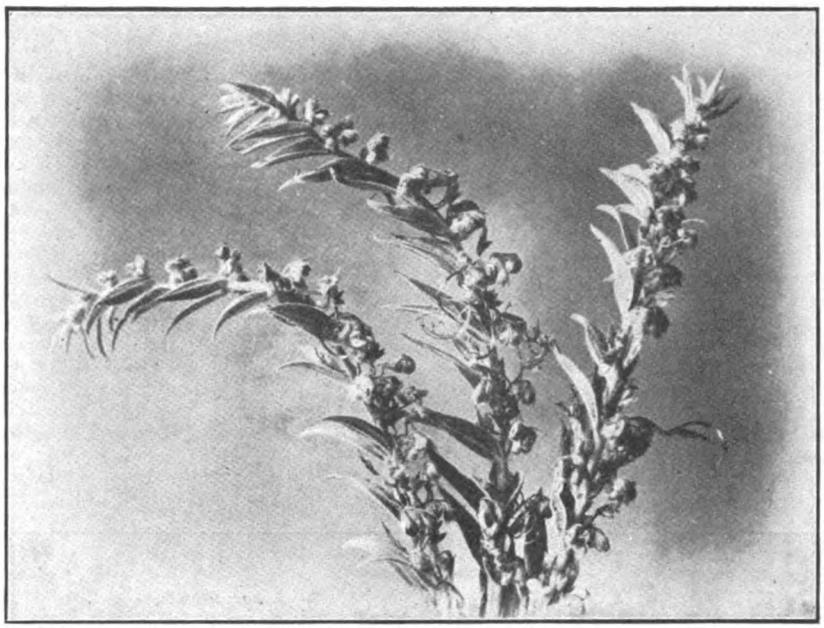
do not want extracted honey. We might compromise by putting the brood-combs above the sections, but if we do that the bees will carry down from the brood-combs bits of dark wax to spoil the snow-white capping of the sections, and that will never do.

The thing to be done is to stop the queen from going with a swarm and from laying until the bees have gotten over their swarming fever, which will be in about 10 days. Different ways of proceeding may be adopted. One way is to kill the cells, cage the queen and leave her caged in the brood-chamber for about 10 days, then kill all cells and release the queen.

Another way is to kill all cells, take away the queen with two frames of brood and adhering bees, put them in a hive, as a nucleus, on a new stand, then in 10 days kill all cells in the old hive and return the queen, either with or without the nucleus.

Later on the colony may take the notion to swarm again, when the treatment must be repeated. But the most satisfactory thing is, after 10 days of queenlessness, to give a young queen of the current season's rearing, after which there will be no further thought of swarming by that colony till the following year.

The reader who is interested in fuller particulars of this subject will do well to consult my book, "Fifty Years Among the Bees," in which 30 pages are occupied in discussing control of swarming.



The Blue Curl in bloom

My Neighbor's Garden

By C. D. Stuart

IT happened earlier in the fall. The Magic Girl had been telling stories to the neighbors' children, who never grew tired of hearing about the bees and the wonderful sweets they steal from the flowers and store away in their hives, when Jimmie slipped away unnoticed. Soon there was a scream, followed by a great commotion in the literary circle. Mad bees were attacking right and left. The Magic Girl herself experienced her first contact with the Bolsheviki end of the honeybee, even while hustling the children to safety.

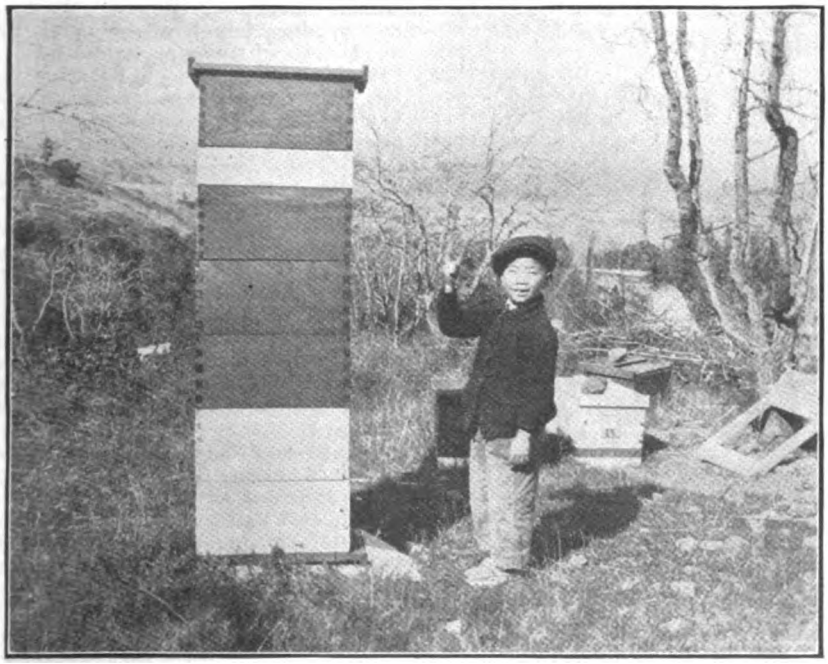
I rushed to the apiary swearing vengeance on the offenders, if found; if not, then the innocent must suffer with the guilty. A man must protect his family, and a mad bee is no imaginary foe. Instinct guided me to a colony of blacks that for weeks had refused a queen, but which had recently accepted, on probation as it were, a newly-hatched Italian. There on his knees in front of the hive was Jimmie, industriously poking a stick into the entrance, and now and then curiously watching the strange behavior of some bees on the landing-board.

One glance was sufficient. They were balling something, and the wonder of it was that they had not balled Jimmie instead. A puff from the smoker dispersed the savages, but not before the ball had rolled onto the ground. A large yellow queen limped away, pursued by a worker more persistent than the others, that still attacked first on one side and then the other, to simulate a large force in pursuit, perhaps, till the queen, overcome, gave up the unequal struggle.

Jimmie turned the dead queen over with his stick and listened to my lurid remarks. I might mention that his baptismal name is Tenaka Kurihara Ishida, americanized by the Magic Girl to "Jimmie." He was small, almond-eyed, and minus two front teeth, neither of which happened to be the sweet one.

"Honey all time stay up in air," he offered by way of explaining his presence in the apiary, and pointed wistfully to the tier of supers filled with honey which had been left over the colony to ripen. Neither was he remorseful over the fate of his playmates, while the sight of the Magic Girl's closed eyes and puffed face appealed to his Oriental sense of humor. "All samee God-Damn-Lady," he observed, no doubt having in mind the corpulent resident missionary to the Japanese in our midst.

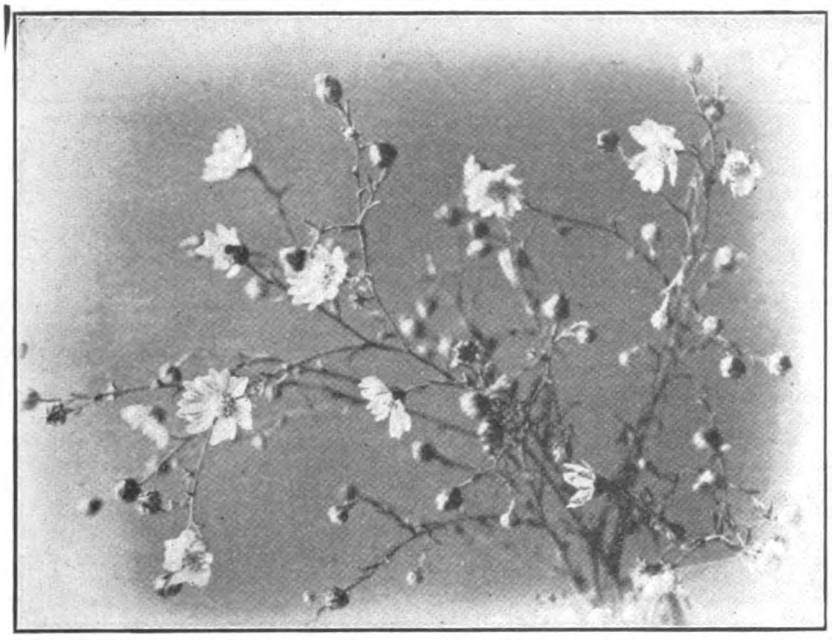
The next time Jimmie's mother came to do up the house, as a matter of personal safety and that of my neighbors, I found it expedient to form a league of two nations, and thereafter accompanied Master Ishida to my apiary. It was too late in the season to sustain the loss of other queens. The days were getting perceptibly shorter and there was a suggestion of frost in the air. It was time to contract hive-entrances, nail down covers and go away somewhere



Honey all time stay up in air

with the Magic Girl for a winter vacation; but like every other good beeman, I wanted first to feel secure in the knowledge that each colony was queenright and snug for the winter, and to be detained by one small bee, although of royal blood, was most exasperating.

I hardly knew how to meet the emergency which Jimmie's unappeased appetite for honey had created. The nectar from flowers in my neighbor's garden was at a precariously low ebb, and only a few drones were flying. To rear another batch of queens under such conditions would be a gamble; but with blue curl and tar weed along the roadsides and in the fields, I decided to take a chance. Also Jimmie, with covetous eyes on the honey-filled supers brought daily offerings of belated sweet clover and alfalfa and



Blossoms of the tarweed

laid them in neat bunches at the hive entrances.

I soon had the necessary queen-cells, which I placed in the belligerent colony and left the bees to their own devices. Jimmie, with what strange workings of conscience over the lost queen I could not fathom, shared my labors. He witnessed the grafting of the new queen-cells from my best breeder, watched the cells fill with jelly and grow until finally the cap was fitted on; and when the first virgin came walking out of her cell to which the cap was still attached by a tiny wax hinge, "All samee littee door," his excitement knew no bounds.

Then came the period of waiting when I was afraid to open the hive for fear they would ball their queen, and afraid not to for fear they had already balled her.

But one day I did look, Jimmie, my faithful ally, at my heels. The colony was lamb-like in disposition, but no queen could I find. The next day it was the same, also the third day. The colony appeared to be contented, though there was no brood or other sign of a queen. I had about conceded her loss in mating, but Jimmie subtly associating the return of the queen with a plentiful supply of honey for himself, continued to hope against hope. Each morning found him at his post in front of the hive with his floral offering, and each evening a disappointed little Jap trudged homeward.

Thanksgiving day arrived and with it Jimmie, to begin his morning watch. The air was soft and balmy, an ideal day for bee work. For the third time I opened the hive containing the colony of blacks. But my last young virgin was not laying, nor was she to e found. Three weeks had elapsed since the date scheduled by the books for a normal queen to assume the duties of family life, and I began preparations to combine the bees with another colony. But Jimmie's expression deterred me. He knew few "Mellican" words. They were not needed. His troubled face was sufficiently eloquent, and I decided to wait still another day.

About noon a radiant Jimmie came flying to the house. "Honorable Missy President, she go in! She go in!" he shouted.

A few moments later I found her, nuptial insignia intact, a lovely yellow against a sinister background of black German bees.

Los Gatos, Calif.

More About Punics

IN our November issue we published an article by Ph. J. Baldensperger in which he takes issue with certain statements of Mr. Hewitt in regard to the Punic bees. First he lists 18 claims made for these bees by Mr. Hewitt and replies to each by corresponding number. Our readers can judge for themselves whether one writer is entitled to more credence than the other.

We have since received a very lengthy reply from Mr. Hewitt in which he reviews the history of the introduction of Punic bees into England and America. We have no space to include the entire article, but we wish to be entirely fair with Mr. Hewitt and to give him an opportunity to state his case. Mr. Hewitt declines to permit us to print any part of his article, unless we include it all, hence we are compelled to decline, since there are 80 pages of manuscript. In order that our readers may be informed as to his claims for these bees, we make the following resume of his reply:

1. He has kept pure Punic bees for 32 years and has sent out thousands of queens, without any complaint on the part of his customers, that they were not as good as represented. He does not withdraw a single item of what he has claimed for Punics.

2. It is difficult to mate them purely if drones of other races are within five miles.

3. He claims that since 1887 he has been able to rear queens from the eggs of fertile workers as often as desired, and that they prove to be normal queens in every way.

4. He has from time to time made attempts to make known the fact that fertile workers of the Punic race are able to produce female offspring with the result that he has been discredited.

5. Under certain conditions they build few queen-cells, but at times they build very many, he having had as many as 500 on one comb alone.

In looking back over the article complained of we cannot see where Mr. Hewitt has suffered seriously. In the June, 1918, number, Mr. John Anderson pays him very high credit, and places him in the class with Huber, and other great masters. In the Baldensperger article, we find only a difference of opinion as to the character of the race of bees under consideration.

The only question at issue, as far as this journal is concerned, is whether or not fertile workers do in fact produce female offspring. If they do, Mr. Hewitt was probably the first to bring the fact to public attention. His observations have later been confirmed by Jacks and Onions, but questioned by other observers.

Feeding Flour

IN the American Bee Journal for March, in the article "Building Up Colonies in Spring," flour is advocated for spring feeding.

I placed several granite pie tins and shallow pasteboard box covers containing a little wheat flour about the yard. The bees paid no attention to it, while two colonies actually starved.

What was my mistake? How should flour be fed?

NEW YORK.

Answer.—You made a mistake if you thought that feeding flour would keep any colony from starving. Neither the field workers nor even the larvæ can live on pollen only. The adult bees can live without pollen and thrive best without pollen whenever they are confined to the

hive, as pollen loads their intestines.

On the other hand, it is proven that larvæ consume pollen, mixed with their food, during their growth. Pollen is probably needed to build up the structure of the bee.

Flour and substitutes are taken by the bees only when they have honey to dilute those ingredients. This is well proven, for pellets of such artificial pollen, dropped by the bees, are found to be moist and have a sweet taste. They evidently bring honey from the hive to dilute them.

As these products do not have the attractive odor of the pollen of flowers or the smell of the hive, it is usually necessary to attract them to the spot by placing in the boxes some pieces of old combs or a little strong-smelling honey. The flour should be packed with the hands so as to make a fairly firm footing, otherwise the bees may smother in it. After they find it useful they will attract others to it by their humming.

Substitutes are to be given only when there is no pollen whatever in the fields. We are told by scientists that bees do not digest starchy food and that it is therefore useless to them. It is even asserted that these substitutes will not feed the larvæ. But we have had our bees use hundreds of pounds, bringing honey to dilute it, and carrying it on their legs. We have seen it in the cells, in the hive, and have never seen any of it thrown out. So, until it is absolutely proven that the larvæ cannot digest it, we will continue our faith in the Dzierzon-Langstroth method of giving it to the bees whenever they cannot get natural pollen.

If you have the "Hive and Honey Bee, Revised," read paragraphs 263 to 270. You will find there the experiments made by Dzierzon and others on this subject.

We are told that bees will even carry coal dust to their hives in times of pollen scarcity. We have seen them tumbling about coal dust and sawdust, but have never seen any of these ingredients in the cells. There is a possibility that very fine sawdust might be used, since many insects consume wood fibre. But the bees' attempt at using it is only accidental.—C. P. D.

The Red-Bud

THE Red-bud, or Judas-tree, **Cercis Canadensis,** is a common shrub or small tree in the southeastern States. It is found occasionally from Western Pennsylvania to Southern Michigan, Southern Iowa and Nebraska south to Western Florida and East Texas. It grows along streams and in the woodlands where the soil is moist and rich. In Alabama it blooms in late February, and in Southern Iowa in April. The rose-pink blossoms appearing in early spring before the leaves are out make the tree very conspicuous during the blooming period. Where the tree is abundant it furnishes a liberal pasture for the bees for early spring brood rearing. Blooming so early it is rarely the source of surplus. In the northern part of its range it often blooms with fruit trees and dandelion, so that it is not as important as farther south.

There is another species in South Texas and Mexico which blooms in March, the Texan Red-bud, **Cercis reniformis,** and one, the Western Red-bud, **Cercis occidentalis,** which occurs in the mountains of California, and occasionally in Utah.

The Red-bud is also known as salad-tree, or June-bud.—F. C. P.

Beekeeping in Morocco

HERE is a little information on beekeeping in Morocco. The bees are black. The hives are made of cork and laid horizontally. In some regions they are very numerous and the Arabs harvest large quantities of honey which they bring to market in goat skins holding about 65 pounds. They transport this on camel-back or mule-back.

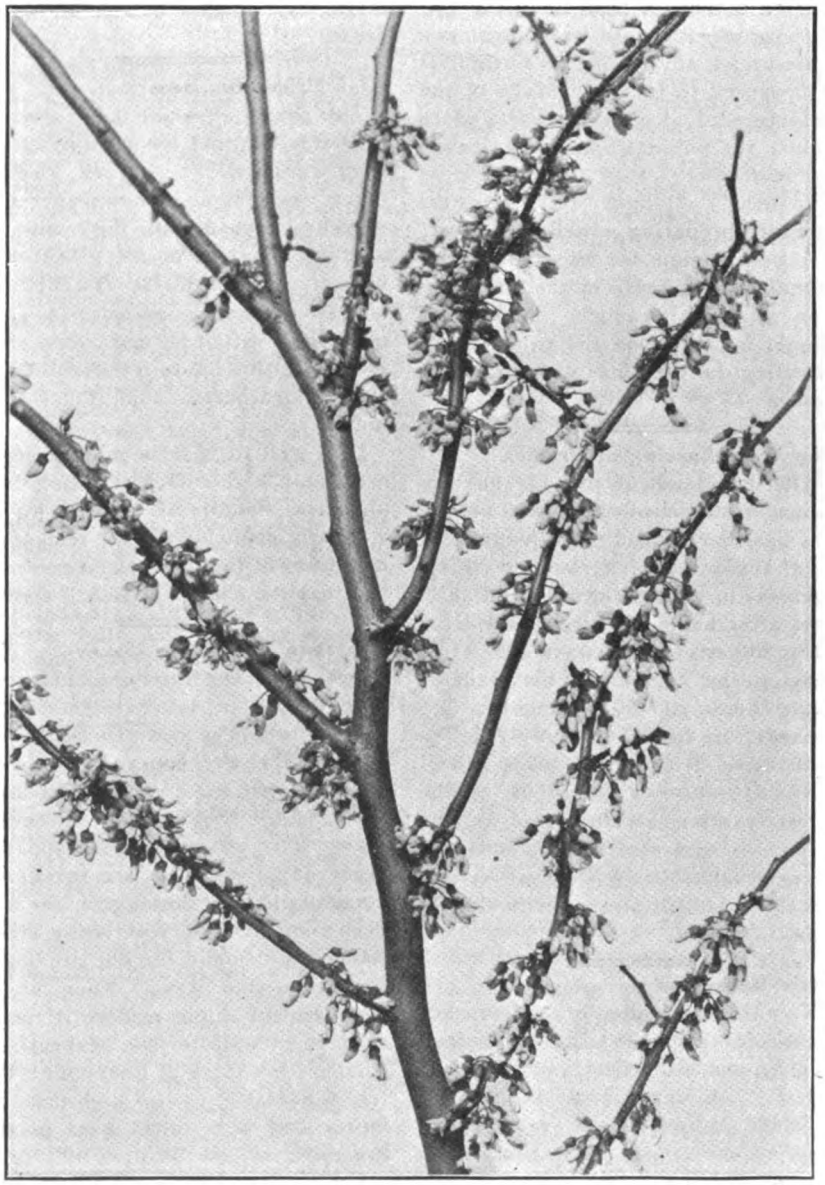
The honey is white, except that of the Sus valley, which is of golden color and of good taste. I bought large quantities, which I shipped to France. But I found one kind of white honey which burns the throat as if it contained lot of sting poison.

The Horticultural Society of Casablanca gives much attention to beekeeping. But movable-frame hives are scarce, and I don't know of any modern apiaries. The flora is rich in nectar from February to May. Just now the ravenelle (wild mustard), peas, peaches and almonds are in full bloom.

Swarms sell for $1, and heavy colonies may be had for $5. Honey sells now at about 30 cents per pound.

I am sorry not to be able to give you more details or to send you photos. I have been in the Convalescent Hospital here and am just about to return to France. Will write you again. QUINTIEN TOUREAUD.

Casablanca (Dar El Beda) Morocco.
Feb. 22, 1919.



Red bud in bloom

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language. Consolidated with The National Bee Journal in 1874.

Published monthly at Hamilton, Illinois.

Entered as second-class matter at the postoffice at Hamilton. Illinois.

SUBSCRIPTION RATES—In the United States and Mexico, $1 per year; three years, $2.50; five years, $4. Canadian postage 15 cents, and other foreign countries 25 cents extra, per year.

All subscriptions are stopped at expiration. Date of expiration is printed on wrapper label.

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THE EDITOR'S VIEWPOINT

To Boost Candy

It is reported that the candy manufacturers of the United States are raising a fund of half a million dollars for the purpose of launching a widespread advertising campaign. It is proposed to take advantage of the departure of alcoholic liquor and to induce the public to substitute candy for it.

In nearly all lines active business men are preparing a well-laid advertising campaign for the purpose of stimulating increase in the consumption of their product. Beekeepers should not overlook the value of advertising in creating a demand for honey.

The Wide Spacing of Frames

The discussion of the distance between frames, from center to center, has been mentioned in Italy, and Alfred Marra, a beekeeper of Milan, reports in "L'Apicoltura Italiana," that after having had regularly from 50 to 80 per cent of swarms, he tried spacing the combs of his Dadant-Blatt hives at 38 millimetres (1½ inches). He had 25 colonies, 2 in Tonelli hives, 2 in Sartori hives and 21 in Dadant hives. Only one of the latter swarmed, while 3 out of the other 4 swarmed. Although he agrees that this is not a positive evidence, he is well pleased with the result.

Dixie Beekeeper

This is the name of a new bee magazine , published at Waycross, Ga., by our old friend and contributor, J. J. Wilder.

Friend Wilder has a very extensive acquaintance with beekeeping throughout the Southeastern States. He is a capable honey producer, one of the largest in the world, and ought to publish a good paper. The first number of his magazine was out in April. Write him at the above address.

High Prices for Bees

The prices at which bees are selling of late would have surprised the most optimistic beekeeper two or three years ago. A newspaper clipping has come to our desk with the announcement of a sale of 150 colonies of bees for $3,000. Twenty dollars seems like a good price for a single colony of bees, and when large lots bring this figure it certainly indicates a prosperous condition for the industry.

It is well to bear in mind that the extremely high prices resulting from abnormal conditions created by the war are probably only temporary, and now is the time to prepare for the reaction that is bound to come.

A Slogan for Selling Honey

Just at present the honey market is very dull, with a very strong prospect of falling prices. During recent months the beekeepers have been able to secure top prices for their products for the first time in several years. It is becoming more apparent every day that if we are to enjoy a good market in the future, the beekeeper must be very active in stimulating the demand for our product in every possible way. When buyers complain of high prices, it would seem to be wise for the beekeeper to compare the price of honey with butter. The public pays a high price for butter and does not regard it as a luxury.

Let us adopt as a slogan the following: "Less than the cost of butter, and a better spread." Such a line on our labels and other printed matter would serve to compare the price of honey with that of a commodity which the public regards as essential and for which it is willing to pay a reasonable price. We might change our honey stickers to "Eat Honey Less Than the Cost of Butter and a Better Spread." By keeping this comparison constantly before the housewife we can do much to remove the impression that honey is a high-priced commodity.

Now is the time of great opportunity for the honey producers. It is not a question of creating a new market but only of retaining the market recently developed as a result of the extraordinary conditions growing out of the war. The judicious use of attractive printed matter together with properly worded advertising will go a long way in this direction. It will be far easier to hold the trade which is already developed than to rebuild it once the public has lost its taste for honey. The wide-awake beekeeper will not neglect to advertise his product.

Honey Grading

Very often, our attention is called by beekeepers to the fact that not enough importance is placed on the subject of honey grading. In order to keep the honey trade satisfied, it is important that the honey which is furnished to the trade be strictly up to grade every time a package is sold. The only way a certain brand of honey can possibly gain a good reputation is by having all of the product up to grade.

In times past certain associations have had a brand for all of their members, and any member was entitled to use this brand to protect his goods. In our opinion, this was a mistake, as anyone might become a member of an association and use that brand. This same member might put up a poor article and in this way bring the brand into disrepute. It is our opinion that sooner or later all honey which goes into the hands of consumers should pass through a central grading plant. Whether the producer expects to ship his honey himself, or whether he expects to ship it to a local association, he would be benefited by having the inspectors' brand placed on his article. Of course, such inspection would have to be very rigid so as not to work injustice to the careful beekeeper who is already

putting out a first-class article. At the same time, it would protect him against the careless beekeeper who puts up his honey in a slovenly way.

Honey Market Reports

The attention of the beekeeper is called to our honey market report. In spite of the fact that last fall we predicted a clean market, there seems to be considerable more extracted honey left on hand than anyone had anticipated. This is largely due to the fact that many manufacturers who used honey instead of sugar in large quantities turned back to sugar as soon as sugar was released. Many of them are holding their honey for the same price that they paid for it, which was around 25 cents per pound in carload lots.

While there is some extracted honey still in the hands of the producers, this amount does not appear as large as in an ordinary season. However, it is bound to have considerable effect on the price for the coming year unless something is done to move this honey before the new crop is harvested.

In sharp contrast to the extracted honey market is the condition of the comb-honey market. There appears to be scarcely any comb honey at all offered and, in fact, it seems to be difficult to secure. The price is high, with little if any sign of weakening. Although the Dadants have been advocates of extracted honey for a great many years, it is their opinion this year that those who have comb honey equipment should, as much as possible, produce that article. Of course, something may happen which will relieve the extracted honey situation, but there is no doubt there is going to be a good demand for comb honey anyway, even though extracted honey should be plentiful.

A few beekeepers have made the remark that our market page was somewhat prejudiced because the Dadants were honey dealers. Let us state here that the amount of honey bought the past season did not amount to as much as what our crops very often total during a single season. In other words, we are not honey dealers in the true sense of the word, as we simply buy enough honey from beekeepers to supply our trade when we do not have sufficient crop of our own. We have no axe to grind and we ask the beekeepers to keep this in mind and make their reports just as true as possible, so we can in turn give reliable information to all of our readers.

Increase With Large Hives

Question. Taking much interest in your articles about large hives, and large frames, I would like to know which method you use the most extensively and consider the best to make increase. We use the Dadant hive here, a so-called Jumbo hive, holding 12 frames, which make a brood-chamber that is none too big for the egg-laying capacity of some queens. RENE SAQUET,
Nantes, France.

Answer. In consideration of the fact that it is the strong colonies which yield the crop, we divide our apiaries into three classes: very strong colonies at the time of the crop, colonies that will become strong during the crop, and, lastly, colonies that will just hold their own.

The first class are the ones from which the crop will come. The third class are not to be depended upon at all, and if the fault is with the queen she should be removed and replaced by a better one. There are however cases, in most apiaries, where a little shortage of food, or a little neglect on the part of the apiarist, will cause a colony containing a good queen to be useless for that season, owing to the lateness of its building up. Usually those colonies of the third class are not numerous. They may be equalized at the expense of the others, but it is a question whether this is profitable.

It is from the colonies of the second class that we aim to take our artificial increase, because they do not become strong until the crop is advanced and many of their bees will help consume the crop instead of helping to produce it.

We begin by either buying queens or rearing some of our own. We will not go into the detail of this matter. Suffice it to say that if we rear our own queens, we breed them from the very best colonies we have. When the cells are built and ready to hatch, on the ninth day from the rendering a colony queenless, we divide each of our middling or second class colonies. On the tenth day we give each of the queenless halves a queen-cell, or a queen.

How to divide each of these colonies is probably what the reader will ask next. This must depend on the number of colonies wanted, the strength of those we have, the weather, the conditions of the crop.

If we want many colonies of increase, we may divide each colony in 2 or 3 parts, taking note of the queenright one. If we want only a few, we may just divide the colonies exactly in halves. If we need still less, we may make a swarm from 2 colonies, by taking the brood from one and the bees from another, putting the brood-combs with adhering young bees in a new hive on the stand of another colony, which we move to a new spot.

Divisions made of only 3 combs, during a good crop, may build up for winter, depending upon the weather or the honey yield. If they do not, we may be able to help them from the stronger ones, or even, at the end of the honey crop, from the very strong colonies that have given us the surplus.

Our plan in all this is to use the bees that hatch too late for honey in making swarms and retaining in full strength the honey-producing colonies, till the end of the harvest. This method has always given us the best results.

In carrying on a division plan of this kind—or of any kind—there are a few fundamentals to remember:

A queenless colony should not be allowed to build comb, as it would build mainly drone-comb.

A queenright colony, or that part of a divided colony will thrive most if it has a few young bees with the queen and plenty of field workers.

A queenless colony on a new spot will be the slowest to build up, unless it has some brood ready to hatch.

A queenless colony placed on the spot occupied by a full colony (removing the latter to a new spot) will be in danger of swarming when its queen-cells hatch.

A queenright colony from which nothing is taken but its field bees will recuperate soon, if there is any honey at all in the fields.

No colony with brood should be left so weak that its brood is likely to be chilled in cool nights.

If we supply all our divisions with full sheets of foundation or empty combs they will recuperate more promptly.

There are many other "ifs" which must be left to the judgment of the apiarist.—C. P. D.

Information Concerning Crops and Markets

Our old friend, Mr. P. H. Elwood, sends us some complimentary remarks concerning our "Crop and Market Reports" and reminds the editor of the organization, in 1888, of the United States Honey Producers Exchange, an association for prompt and reliable information concerning the honey crop throughout the United States. Each month a report was sent by the Secretary to all the members, concerning the condition of the bees, the prospects, the crop, the markets, etc.

These statistics, gathered from reports sent in by the beekeepers themselves, were very useful, and the "Exchange" at first met with great favor among beekeepers. It was originally organized under the auspices of the New York State Association. Mr. Elwood was its President and G. H. Knickerbocker its Secretary. Many leading beekeepers were interested in it. But it lived only a few years, as its members neglected it.

BEES AND BEEKEEPING IN THE ORIENT

By Ph. J. Baldensperger

YELLOW bees, in all the Levant, from Greece in the north, all around Asia Minor, down through Syria and Palestine and far-away Egypt in the extreme south group, are, so to say, all around the Island of Cyprus as the center point. They are yellowest in Cyprus and, as they are more distant from this center, gradually become darker.

On the Syrian coast, and up the Lebanon, the "Syrian race" is nearest in semblance to their ancestor, the Cyprian, as to size and color. Further down the country, south of the Lebanon and to the river known as Wady Ghuzzeh, below Gaza, lives the third race, the "Holy Land" bees. A fourth type, at least as large as the Cyprian, exists on the south extremity of Asia Minor, just north of the Island of Cyprus. The fifth type is the Egyptian, completely separated from its congeners of the Holy Land by the wilderness of Sinai. The Egyptian bee is far the smallest and the darkest of the yellow races.

I have seen and studied the Cyprians at Larnaka, Cyprus; the Syrians at Beirut and Sidon, Syria; the Holy Lands from Acre in the north to the Carmel—to Nazareth, and south to the plains of the Philistines, to Jaffa and Jerusalem; the Egyptians near Alexandria and Cairo, up close to the Pyramids of Ghiseh.

The Syrians and Holy Lands differ slightly from each other, but if Cyprians and Holy Lands are compared, the difference is more striking than between Cyprians and Syrians.

All these bees are very irritable if not handled carefully, and especially amply smoked before they are allowed to become over-irritated. Very adverse reports concerning them have been made by many writers, but I handled hundreds of full honey-producing colonies for over ten years in their native lands, and though I had many bad experiences with irritated colonies, yet when carefully handled, smoking them sufficiently and giving them time enough to know that they are going to be manipulated, they are as supportable as any other race. We had about 500 hives on the same square in the suburbs of Jaffa at one time, and as we were then (in 1885) five brothers, we decided that so many bees, with about 15 persons running about the yard, was too much excitement, and we separated them for the following years into several lots of a hundred to a hundred and fifty hives. There were plenty of orange trees in the immediate vicinity and we thought it necessary to separate them for short distances only. At one time in 1890 my elder brother was in charge of a hundred and fifty hives at not more than three hundred yards from the hundred and fifty in my charge. My brother was always in a hurry to finish his work and had two or three natives to help him—I am almost tempted to say—stir up the bees. As a matter of fact, animals and men were often stung when passing the road, a distance of 50 yards. In my apiary, where I used very little native help, especially about the bees, I never had any complaint of being stung; the above road leading past my apiary at the same distance as was my brother's apiary.

In Beyrout, too, the apiary was close to the windows of the garden house, below the American College, and before going to work in the apiary I could walk up and down or stand in front of a hive, watching the queens on their matrimonial excursion, without ever being molested. With help in the apiary and a man to hold the smoker and puff smoke at the bees when it is necessary, or abstaining from smoke in the nick of time, stings are not rare, even with the gentle Carniolans, to say nothing of our lively Levantines, beginning with the Cyprians.

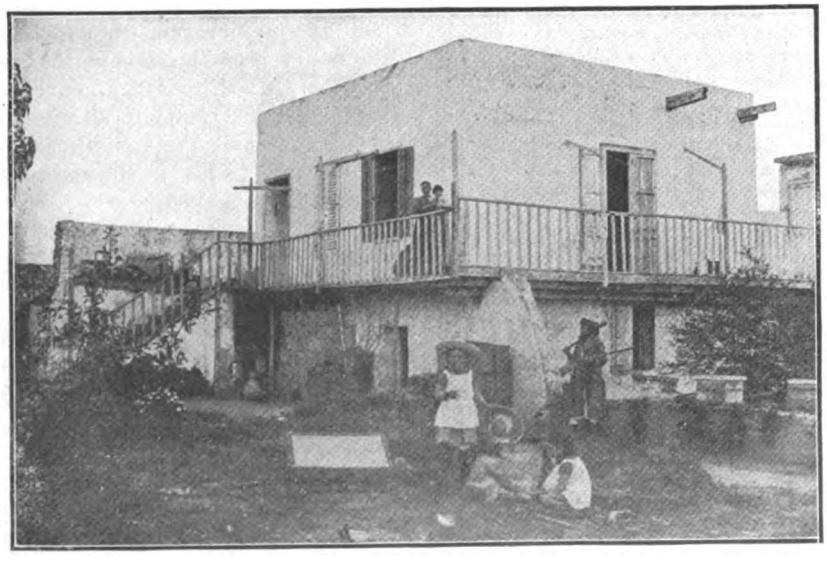


Fig. 1. Country home in Jaffa in 1890, with hives on the wall

The beautiful orange-colored segments at once distinguish the Cyprians from their Syrian neighbors. The crescent at the base of the thorax is brighter in Cyprians than in any other yellow race. The bees themselves are more slender than the Italians and, as a matter of course, are more lively. They rise early and come home late and are ever ready to defend their hives, a characteristic of all Orientals.

The races of bees living in western countries are never troubled to such an extent as the Orientals with all kinds of pests, amongst which the most prominent are the innumerable hornets (**vespa crabro**), which assail them from July to October and oblige them to be ever on the lookout against attacking enemies. They propolize their hives exceedingly, at the entrance, in order to defend themselves against intruders. The drones of the Cyprians have big orange segments, especially on the under side of the abdomen, with dark brown spots on the top, giving them a very pleasant look, reminding one of the panther-like shabrack or saddle-blanket used by eastern warriors. Very likely the yellow bees originated in Cyprus and were known to the inhabitants long before they were known on the continent or in Syria. Herodotus reports that the inhabitants of Amathontis cut the head off Onesilius and suspended it before one of their gates. When the skull was empty, a swarm of bees took possession of this queer hive and filled it with comb and honey. The inhabitants consulted the oracle on what to do; the answer was: "Bury the skull and offer a yearly sacrifice to the hero."

The Philistines who came from Cyprus and the isles and taught their arts in southern Palestine, also imported bees and kept beekeeping as a secret branch of agriculture, long before the Hebrews knew anything of the existence of bees and honey.

The Cyprians are as prolific and good honey gatherers as their sisters of Lebanon and Jordan districts, though Occidental writers have tried to decry them and favor the Italians for many reasons, the first of which is easier access to Italy than to the Orient.

A well-known authority on Cyprians, Frank Benton, once said to me: "Why, even Cyprians cannot get honey from the bare rocks in Cyprus," because of the scarcity of honey-plants.

The home of the Syrian bees is limited on the north by Asia Minor, on the east by the great Syrian Desert, into which no bees penetrate, and of course the Mediterranean stops them short on the west, and the Lebanon range running down towards Phenicia limits them on the south and sep-

arates them virtually from their Holy Land sisters.

The bright golden crescent of the Cyprians becomes darker, though still visible, and the orange color of the insect changes into pale citron; the workers are a trifle smaller. No change as to liveliness of character worth mentioning. The Syrian drones are bright-colored, with brown spots.

Syrian workers fly out early and come home late, and if given the occasion, can gather as much honey as Cyprians or Holy Lands. Beyrout, where I had an apiary for several seasons, is not much of a bee pasturage, as the houses and villas are usually surrounded by mulberry trees, for the silk worms, excluding honey-plants, except the cactus hedges (**Opuntia**) which blossom in May.

The queens are as prolific as Holy Land queens, moreover, they lay just a few hundred drones less than their Holy Land sisters and, but for a slight difference in color, do not, as a rule, vary. The best stock can be had between Tripoli, Syria, and Beyrout, along the narrow strip of plain or undulated low lands between the abrupt chains of Lebanon and the sea.

I am inclined to think that Syrians are not so excitable as their northern neighbors, because bee pests abound much more in the south, where nature has bestowed more resources to the breeding of the hornets and wasps, by way of fruit trees, and to the multiplication of the stellion, a thorny lizard, sometimes fattening on bees. The stellion is a known feature of the Orient, dark grey in color. He is met with all over the grey rocks in this land of greyness. Living on small insects, he may be quite blessing where grasshoppers and flies of all kinds abound, but what a nuisance to apiaries! He has the advantage of having a gelatinous substance around his formidable jaws, in which the bees leave their stings before being swallowed. A captured stellion one day showed us over a dozen bee-stings on his gums and did not seem at all troubled by the poison.

We had an apiary out in the plains of Philistia, near Ekron, famous for the "god of flies" (Baal-Zebub) in ancient times. Stellions were so numerous that we had to dig trenches around the hives to protect them, yet in our absence the trenches were forded and the bees decimated. We carried them to a neighboring house for protection and put wire cloth on the windows, but hornets also assailed the bees. The isolated house was between Gaza and Jaffa, and in our absence an earthquake buried bees, furniture and house in the rubbish, so hornets and stellions could no longer linger about for them, and, as in olden days, "the land had rest for many months."

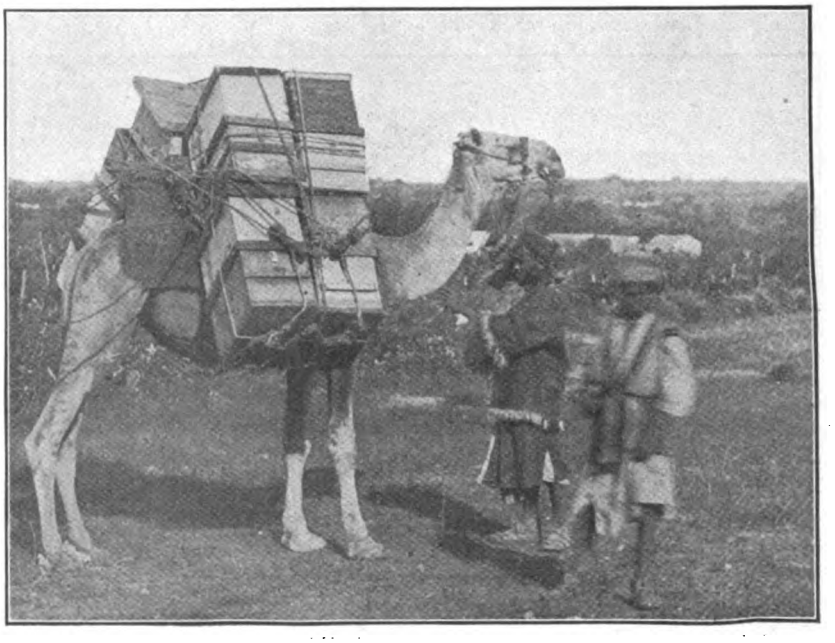
Holy Land workers are slightly smaller than Syrians, and fuzz also is more abundant, and decidedly grey in color. Holy Land queens are hardly to be distinguished from Syrians; some mothers are very small, others larger than Syrians; in color, too, as a rule, they are slightly lighter colored. The Holy Land bees are now found all over Palestine and the inhabited parts of the Trans-Jordan country; in the north, to the sources of the Jordan; in the south to Gaza, where the Sinaitic Desert cuts them short; in the west to the Mediterranean, and to the east the Syrian and North Arabian deserts oppose their sands to the continuation of bee culture.

Beekeeping still flourishes in the plains with greater success than in the sterile mountains of Judah. Big apiaries, containing hundreds of clay cylinder hives are met with in most villages of the plains, whilst the traditional apiaries about Jerusalem and Bethlehem, seen by occasional travelers, are rather apologies of apiaries to compare with the lowland stock. Bee pasturage is very abundant along the Maritime plains, from February to July or August. Through the long rainless summers, which greatly hinder the secretion of nectar in orange blossoms, cactus, thyme and lavender, moisture from the dews, which fall heavily in western Palestine, revives the nectaries.

Holy Land queens, as already stated, differ very slightly from the others, though occasionally a beautiful colored orange insect is met with. As a rule, when left to their instincts, they rear about one-fourth of drones. As soon as the colony has reached its full development they are as prolific as the other yellow bees, and more especially, a full colony will raise hundreds of good queen-cells; this is a specialty of Holy Lands. A noted beekeeper visited me one day in Jaffa, when I was in bed with the fever. I jumped up when he told me his name—P. C. Schachinger, of the Bienenzeitung, in Budapest. I showed him a hive bearing his name, and as we hunted the colony for the mother we counted 385 queen-cells, yet the stock did not swarm. To explain, they would have swarmed if I had left them alone for any length of time, but I usually made artificial swarms when the colonies had over twenty frames of brood. Sometimes I waited until they had twenty-four, but that only happened in April, during the orange honey flow.

The greyish yellow workers are as lively as their yellow sisters, perhaps a little more so, because of the huge hornets which nestle in the sandy plains around fruit-growing localities. When the hornets can find neither bees nor fruit, they feed on carrion, which, in the olden days, was found along the roadsides leading to towns and villages. The bees in the skull of Onesilius reported by Herodotus, the hornets feeding on carrion and cleaning the skeleton in a few days, the foxes and jackals helping them in their work; the ignorance of beekeeping in biblical days, witness the story of Samson and his swarm in a skeleton, point to the confusion of bees with hornets found in scripture. The honeybee was brought to Palestine either from Egypt or Assyria, or from both, for as late as King Ahaz, of Judah, more than four centuries after the Samsonian epoch, Isaiah says: "And it shall come to pass in that day, that the Lord shall hiss for the fly that is in the uttermost parts of the rivers of Egypt, and for the bee, that is in the land of Assyria, and they shall come and shall rest all of them in the desolate valleys, in the holes of the rocks and upon all thorns, and upon all bushes." (Isaiah vii, 18-19.) The Hebrews only knew Deborah, the bee or hornet, whilst the Arabs call bees Nahel, and the hornets Dabour. Now the word "Nahel" derived from the verb "nah," to sigh, to mourn, is of Egyptian importation. In the hieroglyphics, the bee is represented as the sigher, the mourner for the departed, on account of the sighing sound which is heard at the hive entrance.

The bees have thus taken the road



Camel carrying 600 pounds of honey

from Cyprus to Egypt, and from Egypt to Palestine, modifying colors and habits in the course of many centuries, till they arrived at the modern stage of fixity, a Palestine greyness.

When we left our country house in Jaffa in charge of the Moroccan guardian (see the photo, where he is armed as for war, with my wife holding the baby on the porch and the children around the solar wax extractor and hives) we sent down to Jaffa our extracted honey, filled into oil cans, boxed and carried by camel back, to be ready for shipment to Europe. Single colonies often gave over a hundred pounds of orange blossom honey, in April. As soon as the blossoming was over, the hives were strapped by fours, and two such packets were placed on a camel to carry them towards the plains of Sharon and Philistia, for an outing of four or five months. As we worked largely for extracted honey, the combs were emptied two or three times in April, once or twice in May and June, out in the plains, and once more in the mountains, in July.

This manipulating stopped the swarming fever, and as long as we were busy about them, we rarely had any swarms, though brood often filled three-fourths of the hive. We then, and still use, our pastoral hive, containing thirteen frames in each story. The frame measures 10x11½ inches. We adopted the small frame on account of the handy size (a full comb weighs about 4½ pounds of honey) to load the camels. A full hive of two stories weighing about 80 pounds, with comb, bees and a very little honey, to reach the next pasture, is also about all that a man can lift alone.

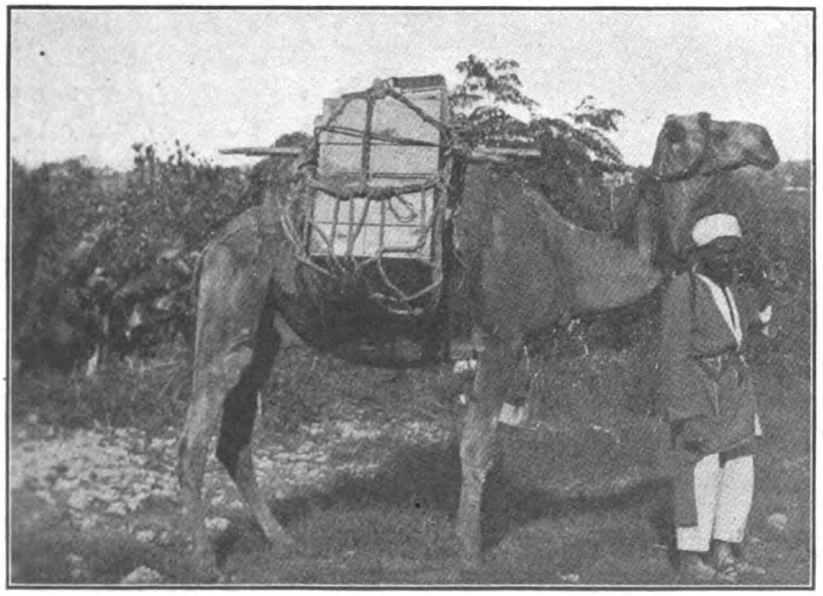
In Palestine, the bees winter well, especially in the heights of Judea, where winters begin in December and end in March. On the Maritime plains they have very short winters, and no real cold to speak of. We would have very cold days from Christmas to the middle of January, relatively, as the thermometer hardly once came as low as 31 degrees Fahrenheit. At the end of January and beginning of February almond trees begin to bloom and bees find food already, though not sufficiently to live upon if they did not have their 10 pounds of stores. Certainly a Jaffa colony, taken without preparation from Jaffa to Paris or London, would winter very poorly, whilst a Jerusalem colony would stand the winter better. I have had bees high up in the Alps, which came direct from Jaffa the previous summer, and which wintered fairly, and especially in the second generation, crossed with blacks.

As for propolizing, possibly it is a question of occasion; the orange trees have no propolis, nor have the honey-plants in the plains; whilst propolis is more plentiful where olive trees abound. We, at all events, had never to complain of propolis; on the contrary, we would have wished for more to hold the frames better in place when shaken on camel-back. As we always worked for extracted honey, propolizing never affected us. It is true that had we tried to work for sections, it would have proved a failure. Orientals don't build out the combs easily in sections, and they seal the honey at once, which gives the comb a greyish or watery appearance, not very attractive for the admirer of white section combs.

Tunisian bees I have found to be the worst propolizers. These bees build deeper sections, but have the habit of smearing the corners with propolis.

Egyptian bees are the smallest and the darkest of the yellow races. I have not tried to cross Egyptians, but all others have readily mated with Carniolans, Tunisians, Algerians, Caucasians, Italians or common blacks, such as we have in Nice.

I have talked with the owner of a big apiary near the Pyramids. There were nearly four hundred hives in one yard. The Nile hives, made of mud and dried in the sun, were arranged very much in the manner of the Caucasian apiary which embellishes the cover of the December, 1918, number of the American Bee Journal. As the stellion, already mentioned, lives in Egypt and would work much havoc among the bees, the hives in Egypt, as well as in Palestine, are all plastered together with the same stuff, and thus prevent the stellio-lizards from hiding below or above the hives, as they could do in the Caucasian apiary indicated.



Camel loaded with eight hives enroute for the pasture

The Egyptian beemaster showed me his hives, opened a few at the back, without even using smoke, and we walked up and down for more than two hours without receiving a single sting. A good Bingham smoker, which always accompanies me, subdues any race; provided the beekeeper knows what he is about and never troubles his bees uselessly or opens their hives without advertisement, the Egyptians will prove no crosser than others.

Fertile workers have been said to develop in abundance with all Orientals. We reared, yearly, several hundred artificial swarms and we were rarely troubled by fertile workers. Surely, if mothers fail to be mated for some considerable length of time, fertile workers will show up. Owing to hornets and the spirit of self-preservation, young queens would often hesitate to fly out to mate, and time and again I have almost lost patience with them, as often they would mate between the twentieth and thirtieth day, without a single fertile worker developing nor a failure in the laying capacities of the queen in after life.

The Egyptian bee is limited by deserts on all sides, the Sinaitic desert to the east, the Libyan desert to the west. Tripoli, beyond the desert, has the black bees of North Africa.

I never met any kind of foulbrood in the East during my stay as beekeeper, from 1880 to 1891; though I handled thousands of hives, bought in the native clay cylinder hives of the plains of Sharon and Philistia, and the mountains of Lebanon and Judea. Transferring them from clay hives to movable-frame hives, every brood-comb was minutely examined, yet I never saw a touch of the brood pest. It was not until 1894 and 1895 that I first saw the worst kind, bacillus larvæ, or American foulbrood, as you call it. I call it "gluant," on account of its gluey odor and sticky, long-drawn characteristics. I call the other kind "puant," or European foulbrood, as the Yanks call it, on account of the pestilential odor. I had very much to battle against both kinds, and find the difference very great between one and the other; the gluey sticks closer to you than a brother and it is almost impossible to get rid of, if you keep the hives and comb; whilst the pestilential is a friend, to compare with it, as it can be easily mastered by the intelligent beekeeper.

In the course of time foulbrood found its way to Palestine, too, after I left. I could not make out how it was introduced, probably by some ignorant beekeeper introducing foreign blood with infected comb.

Nice, France.

Death of Frank Benton

THE name of Frank Benton may not awaken any recollections in the minds of beekeepers who have been less than 20 years in the business. Mr. Benton, however, was one of the most active beekeepers of the last 25 years of the Nineteenth Century.

From 1880 to 1885 he traveled, first with D. A. Jones, of Canada, afterwards alone with his wife, in Cyprus, in Syria, in India, in Ceylon, Java, Bavaria and Carniola, investigating the different races of bees and shipping them to America.

Later, as assistant entomologist, in the U. S. Department of Agriculture, he published a number of bulletins on bees, among the number a book of 118 pages, entitled "The Honey Bee," (1899). He was sent for a trip around the world by the same department, to search for the different races of bees. But for some unknown reason he never made a report. Altogether, he spent 12 years abroad.

Mr. Benton was a very capable beekeeper and of very extensive knowledge. He was born July 5, 1852, in Coldwater, Mich. His education was obtained in the public school of that city and in the Michigan Agricultural College. He taught for a few years in rural schools and in the University of East Tennessee, but soon abandoned this work for beekeeping.

He wrote many articles on bees for different publications and was the inventor of the mailing cage known as the "Benton cage." He was a linguist, speaking fluently several languages.

Searching for the big bees of India, Apis Dorsata, he contracted jungle fever, which was the beginning of years of ill-health for him and caused his retirement from active labor, but not from continued interest in apiculture. He sought some betterment of his condition in the warm climate of Florida. Death occurred at Fort Myers, February 28. There are left to mourn his loss one daughter, Mrs. C. C. Ford, of LaGrange, Ill., and her three little daughters; one son, Ralph Benton, of Los Angeles, Calif., and three sisters, Mrs. Charles N. Legg, of Coldwater, Mich., Miss Eliza Benton, Barre, Vt., and Mrs. George W. Martin, of Laporte, Texas.

Co-operation in Experiments

IT has often occurred to me that the editor of a bee journal, like the editor of a chess magazine, avails himself of the activities of his subscribers in making tests and experiments for the good of the cause. For instance, certain chess players will be furnished with certain "tasks," as these are termed; that is, they will be asked to construct, say a chess problem, in which a checkmate is brought about by certain specified pieces in a specified number of moves and by means of a certain specified procedure; in this way, the chess playing public secures the result of the combined effort of the best analysis. Similarily, in your department, why not assign to certain beekeepers certain tests and experiments which they will be required to work out and report upon; the greater number applying themselves to one problem, the greater would be the certainty of the ultimate analysis. Of course, the only reward would be the usual one of the scientist, but the greatest of all rewards, a sense of having further unravelled the mysteries of nature.

For myself I have the following task, having regard to what Dr. C. C. Miller says on page 183 of his "Fifty Years," namely:—a comparative test to ascertain whether a new queen every season will result in greater productivity as against queens of two or more years' standing. This experiment, in order to be reasonably sure of hitting the mark, will take several years, and, in the interim, I shall have plenty of time for other tasks, and, in order to start my suggestion going, I shall be pleased to experiment upon any task which you, in your investigations, may think desirable of having data upon. I propose making an observation hive, and have written "Gleanings" for instructions as to the construction of the Miller observation hive.

C. F. DAVIE,

Victoria, B. C.

(Let us have suggestions as to what lines of experiment can be followed by a number of beekeepers at the same time with profit.)—Ed.

BEEKEEPERS BY THE WAY

A Gentleman From Texas

THERE are two things that E. G. LeStourgeon, of San Antonio, never overlooks—an opportunity to boost, first our beloved pursuit of beekeeping, and second, his native State of Texas. If you don't like

A Texas Booster

Texas, never be guilty of betraying the fact to LeStourgeon. He is prepared to prove beyond a shadow of a doubt that it is the biggest and the best State in the Union; that it has more sunshine and greater opportunities and finer climate than any other place in the world. Likewise, he knows full well that beekeepers are the finest class of people, and that beekeeping is the most fascinating pursuit ever developed.

When Roosevelt was organizing his famous Rough Riders, LeStourgeon was a frail youngster who stood little chance of getting into the army. However, he could ride, and when an outlaw pony threw some of the ambitious boys who were anxious to go with the outfit, LeStourgeon volunteered to ride the pony, and did so. This attracted Roosevelt's admiration and he invited our friend to join his organization. The surgeons, however, decided that he was a better subject for a hospital than for the army, and told him so. What Roosevelt said to the surgeons is not recorded, but it is said that they quickly changed their minds as to the fitness of the new applicant, and he went to Cuba with the Rough Riders. On his return, at the close of the Spanish-American war, he toured the State of New York with Roosevelt during his famous campaign for Governor. The friendship that started when the outlaw pony brought the desired opportunity to get into the service, lasted till the death of the famous President.

Later LeStourgeon became a traveling salesman and toured the northern States. When in St. Louis or Cedar Rapids, LeStourgeon heard of the fame of Texas honey, he decided that he was overlooking something, so threw up his job and went home to go into beekeeping. Mindful of the usual expert advice to begin beekeeping in a small way, he bought 800 colonies to start with. In the February, 1916, issue of this journal is the story of the way he sold his first car of honey.

Most everybody in Texas knows LeStourgeon as a booster for beekeeping. Those who are better acquainted with him know that he is worth cultivating for a variety of reasons. He can tell you a lot of Texas history and can entertain his friends by the hour with tales of the old missions and the pioneers of the southwest. Every beekeeper who finds himself in San Antonio should be sure to visit the headquarters of the Texas Honey Producers' Association and get acquainted with the manager.

Dixie Beekeeping

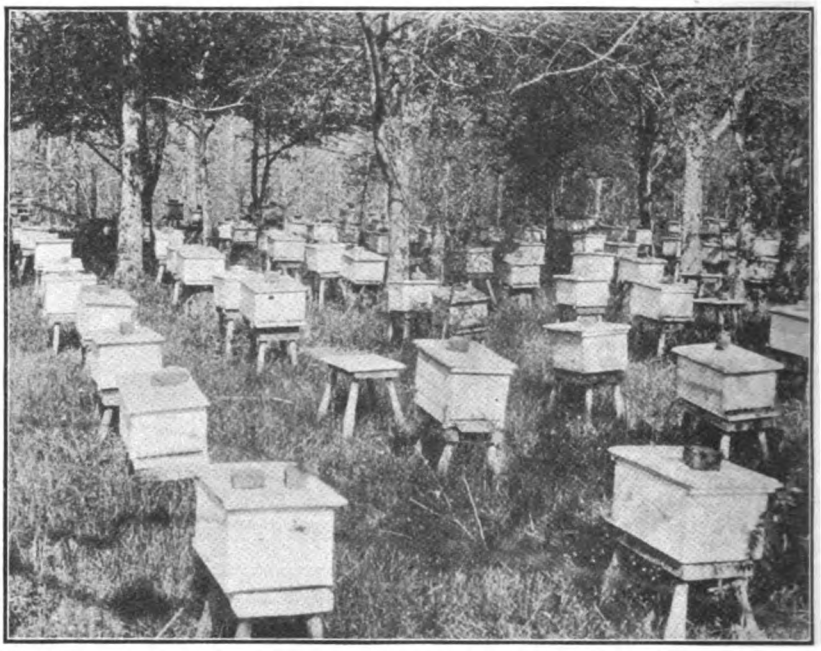
By Kennith Hawkins

IN my four years of work in the extension office of the U. S. Department of Agriculture, I have probably been asked more than any other, the question: "Where can I settle in a good bee location in Dixie?" My advice to the northerner going to Dixie is not to keep bees until he has been South one season and knows something of the location he is going to take up. Otherwise he may be disappointed. There are hundreds of good locations in the South for beekeeping, some of which I should like to take up myself. I speak particularly of Louisiana, Florida, Virginia, West Virginia and Kentucky. Those who wish to locate in any one of these States should communicate with the extension division of the several State colleges of agriculture. Information can be gotten there, far more accurate than mine, on definite locations. I spent too much time on the Pullman to know much about particular localities.

I want to emphasize that in a great portion of the South there is a real wintering problem. In the regions of the Virginias, Maryland, Kentucky, Tennessee, Arkansas and Oklahoma some winter protection is needed. Just how much I do not venture to say. I believe rather heavy packing would pay, in the northern part of the States mentioned. In the other States, certainly better winter protection than is given, is needed, in many cases.

The critical temperature at which bees begin to form a cluster and to generate heat by muscular activity and the consumption of honey, is 57 degrees. That was determined by Mr. George Demuth, working with Dr. Phillips, at the Washington bee culture laboratory. That fact will be accepted without dispute, I think.

Consider, then, that the weather bureau reports for an average year at Louisville, Ky., show that in a twelve-month period, there were but sixty-two days when at some time in the day the temperature did not fall to 57 degrees F., or below.



A Mississippi river bottom gum location in Arkansas

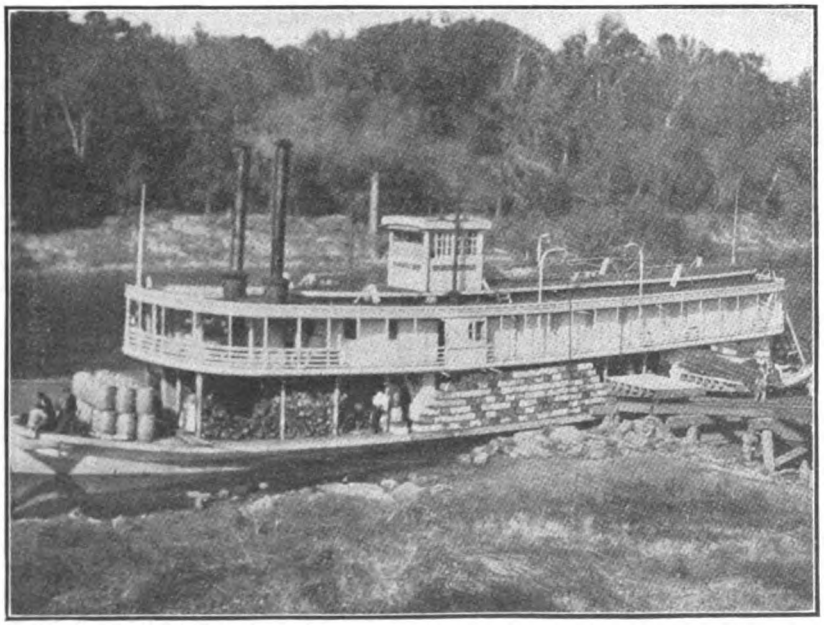
In the South, and, for that matter in the North, too, there are hundreds of locations where the beekeeper does not get the maximum yield of honey because of poor wintering. The fact that a colony of bees comes through the winter alive, is not at all a sign that the colony wintered well. This is a problem to be worked out. Experiment will give the answer.

Now, as to sources of honey in the Southern States. The South, as a whole, including all those States south of Maryland, West Virginia, Kentucky, Arkansas and Oklahoma, may be roughly divided into three great areas. The first and northernmost is a mountainous region extending from Maryland to Colorado. The second is a great alluvial region extending across the entire width of the same section, beginning in Southern North Carolina and extending across Central Georgia, Alabama, Mississippi, Southeast Arkansas and most of Texas. Below this is the third region, which extends in a way difficult to describe, mostly along the coast of all the States in this region and in some cases for many miles back.

In the first region, probably the three principal mountain sources of honey are basswood, tulip, poplar and sourwood for the region east of the Mississippi river. Also there are, in portions of West Virginia, Kentucky and Tennessee, great areas which must be included in the white clover belt, and which are very important sources of that honey. West of the Mississippi the sources of honey are rather indefinite so far as my knowledge goes, as in but few cases the same honey plants prevail, and in great portions of Arkansas and Oklahoma there are no localities where bees may be profitably kept.

In the alluvial region, extending across the territory east of the Mississippi river, probably one of the most prevalent honey plants is gallberry, which yields an amber honey, as do sourwood and tulip poplar when mixed with the other flora. In some portions of this section cotton is a source of honey, and field peas, soy beans and similar field plants form additional important sources. Special attention must be called to the great region in part of Georgia and most all of Central Alabama and Mississippi, where a great white sweet clover area exists from a natural growth. This is an extremely valuable and safe honey-producing region, which, however, is being undermined gradually by the introduction of cattle, and the sweet clover suffers as a forage crop.

In the region further south, which



Carload of bees enroute on the Chattahoochee river. Shipped by F. W. Sommerfield,

ranges from the lowlands along most of the coast and far back in portions of the Carolinas, Georgia, Florida and Louisiana, and into all those States which border the Mississippi river, there is a typical swamp flora which is so varied that it is impossible to describe it in a short space. Gallberry is again an important source here, with black and white tupelo, saw and cabbage palmetto, citrus trees and thousands of vines, as well as a number of cultivated crops. Probably two of the best gallberry regions in the country are located in North Carolina and Southern Georgia, reaching down into Northern Florida.

West of the Mississippi river, in Northern and Eastern Texas, is the best cotton honey area in existence, on the deep, sandy, black loam soils. Horsemint is also an important source here, and in some portions of this territory sweet clover is also coming in, even as far up as Northern Oklahoma. Southern Texas, between the Mississippi and Galveston, appears to be a rather barren bee country. Western Texas, which is subject to periods of drought, has several valuable and important plants. Among them are huajilla, catclaw and trees of the acacia family. All are valuable for white honey and cover most of the desert portion of Texas.

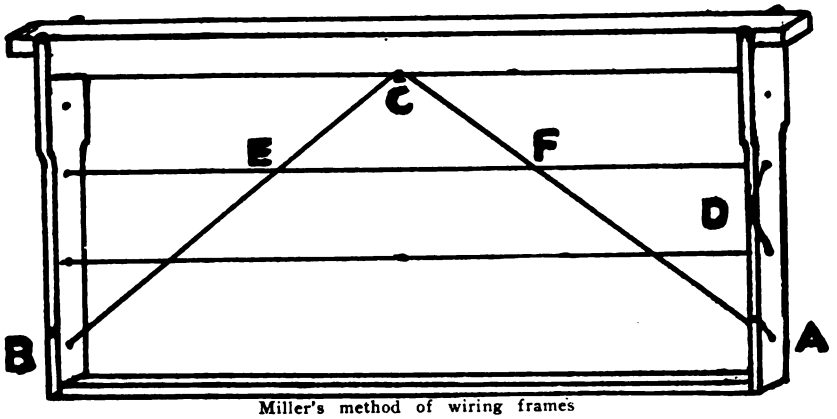
Beekeeping is fairly well advanced in most of this territory, except in a few regions where box-hives predominate. The territory is devoted to the shipment of pound packages of bees, where a long spring flow builds up the colonies so that many pounds of bees may be taken away from them before the main honey-flows begin.

Nearly all the honey of the South is a good quality and flavor, except in scattered regions where bitterweed is prevalent. Honey from this source is unpalatable, but bees will not work it when any other good honey-plant is in bloom. Its season is definite enough so that good beekeepers may extract in time to prevent mixing and may use the bitter honey to feed back to the bees in the fall for wintering purposes.

Watertown, Wis.

A Scheme to Prevent Sagging Combs

IT is to be hoped that the future will bring forth some process of manufacturing foundation that will obviate the necessity of wiring. In the meantime, I would suggest a mode of wiring frames that will, in a measure at least, prevent the sagging of foundation which commonly stretches the cells for an inch or more below the top-bar. The plan is best shown by reference to picture. Half-inch nails are driven part way in at points A, B, C and D. The wire is passed through the perforations at A and B. The frame is then inverted and the wire given one turn about the nail, C, which is on the under side of the top-bar, as near as possible to the groove made to receive the foundation. The wire is then drawn to moderate tension and fastened to A. Next, with a pair of pliers, the kind commonly used about automobiles, the nail, C, is pressed in, drawing the diagonal wires taut. The horizontal wires are next inserted in the usual way. It is best to drive the nails, A, B and D, on the same side of the frame as is the wedge or corner piece. The nail, C, is, of course, on the side opposite, close to the groove.



Miller's method of wiring frames

In inserting full sheets of foundation it is found best to slip them in between with the diagonal wires on one side and the horizontal wires on the other. For imbedding we use a small transformer attached to an ordinary electric light socket, reducing the pressure to about six volts.

It will be observed that the wax which tends to hold the wires together at points E and F prevents sagging, which is almost sure to occur with ordinary horizontal wiring, if the weather is hot and there is any considerable weight of bees. The time required to wire frames in this way, after one acquires the knack, is about the same as for horizontol wiring.

It would be of interest to have reports from any others who may have actually tried out the diagonal wiring in connection with the horizontal here shown.

E. S. MILLER,
Valparaiso, Ind.

A Boy's Beginning With Bees

By Elmer Okerlundt

Editor's Note.—The following account of a boy's first beekeeping experience should be of interest to every beginner. It shows that a fellow with a good book and good sense can soon master the essentials. It is surprising that such good practice should have been followed from the first with the little help except the book:

IN the winter of 1917 (when I was 17 years old) I decided to buy a swarm of bees and experiment. As for me, I knew no more about bees than the man in the moon. I had never seen the inside of a beehive and did not know the names of any fixtures. Therefore, my first move was to find a catalog and study bee supplies. As soon as I got so I could tell comb-foundation from a super I went to see one of the neighbors. At that time he owned about 15 colonies in 10-frame hives, part of which were Italians. He ran them for extracted honey. Upon hearing that I was interested in bees he gave me about 25 copies of the American Bee Journal and Dr. Miller's book to take home and read. The more I read, the more interested I got, and before I knew it I had the fever real bad.

On April 15 I decided to commence. A neighbor agreed to sell me a swarm, so I drove over and got it. I got them home all right, but when I uncovered the entrance my courage began to fall. Soon I got nerve enough to remove the cover and looked into a hive of bees for the first time in my life. And a hive it was, indeed. The frames had not been out since they were put in and were perhaps 10 or 15 years old. I was unable to remove any, so I put the cover on again to wait until some other day. My first step was to make a good stand for them.

Although I had been told not to bother my bees until dandelion bloom, I could not resist the temptation, so one Sunday in April, when it was almost cold enough to freeze ice on hot water, I decided to interfere. With the aid of a screw-driver and wrecking bar I succeeded in removing the frames, although I broke several of them. The combs, like the bees, were black as coal, and so crooked that when I transferred them I could not find room for more than 7, so I threw one away. I looked in vain, but saw nothing that resembled a queen, and although I got a few stings, I was well pleased with my first adventure with bees. I knew I could handle them on a cold day, at least. After a while I put a hive-body with full sheets of foundation under the other one and as the weather was good they made wonderful progress.

The colony built up strong for winter, but we had a very poor season. In spite of these conditions, I managed to smuggle away with 75 pounds of extracted honey. I considered this pretty good for a beginner, but the lessons I learned that one summer were worth more to me than all the honey I have ever produced. In the fall I thought they felt rather light, so to be on the safe side I fed them about 5 pounds of granulated sugar.

On November 17 they had their last flight, and on the 25th I brought them into the cellar. Our cellar, in my opinion, is not a very comfortable place for bees or anything in general. The most objectionable thing about it is its dampness. The temperature varied from 35 to 50 degrees. I can only add that although the combs were a little mouldy when I removed them, 109 days later, those bees wintered well and were in excellent condition the following spring.

I got the fever worse than ever and began to figure on beekeeping on a larger scale, or as much as my capital would permit. During the winter of 1918 I made plans to purchase a few more swarms in the spring. My father was handy with carpenter work and he agreed to make hives, bottom-boards, covers and frames if I furnished the lumber. Accordingly I purchased some 10-inch white pine boards. I wanted to be strictly up-to-date, so the 10-frame hives, metal spaced frames, double telescoping covers and Dr. Miller's 2-inch deep bottom-boards were made. This has always been my equipment, and I think it will continue to be until I discover something better. After purchasing some queen-excluders of the wood and 7-wire type, and some brood foundation, I had equipment enough for five or six swarms. I wired my frames and put in full sheets of foundation.

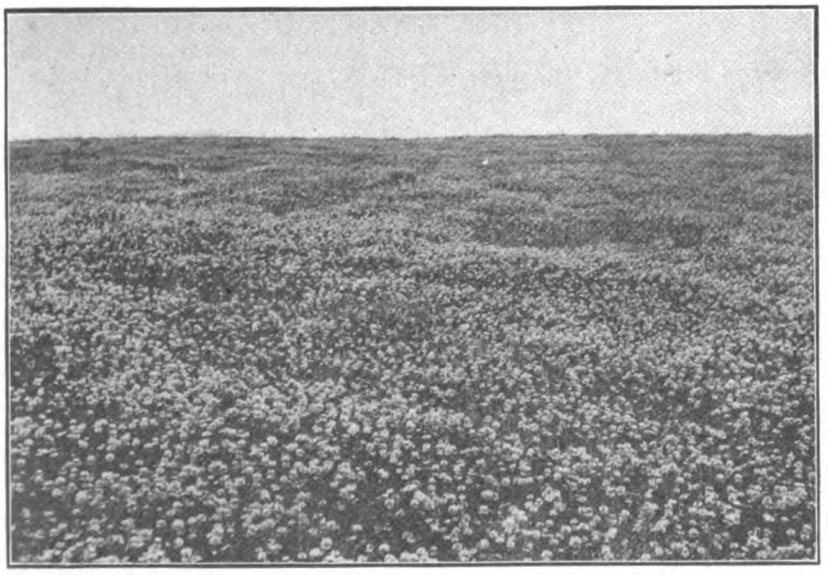
In the spring I purchased four more swarms of black bees from a neighbor, paying $3 apiece for them. They resembled the first swarm I purchased, very much, but perhaps not quite as bad. One nice day in the latter part of March I transferred them into my modern 10-frame hives, filling the vacant spaces with some combs I had on hand from the preceding year. I also found and clipped the queens at the same time. At first I found them by sifting the bees through a queen-excluder, but after a little practice I got so I could distinguish them readily while on the comb. These bees seemed to be of a gentle disposition, and I commenced to wonder what a person wanted with Italians. Of course, I found out why a person wanted Italians before the summer was over. On April 1 they commenced to work on the willows, which are the first honey-plants in this vicinity. About the 1st of May the dandelions make their appearance, while the willows generally continue to blossom until the 15th.

Like all beginners, I had drawbacks, and the worst one was my lack of combs. My best substitute was full sheets of foundation. Along about the first of May most of the colonies commenced to need more room. All those that were strong enough to need it I gave another story of frames with full sheets of foundation. For several reasons, I always put this second story below the other one. As the nights were still very cold, occasionally, I felt safer by adding them below, as it enabled the bees to keep up their normal temperature. An empty super is a bad thing to place over a colony in early spring. Besides, I wanted to induce them to do as much brood-rearing as possible, and I noticed they worked down easier than they worked up. The main reason, however, for my putting them below was to be able to put queen-excluders on after a while, allowing the brood to hatch from those old combs in the top story, so that I might extract from them as soon as possible and get rid of them. When the colonies were strong enough to need it, a third story was added. As the bees always showed a tendency to store their honey above their brood, this story was given on top.

During the first days in June the white and alsike clover began to appear. All the colonies were three stories high now, and things commenced to look pretty lively. I had been going through them once a week, regularly, up to this time, looking for signs of swarming, queen-cells, etc. While going through them on the 9th day of June I saw all the queen-cells one could ever wish to see. I had been looking for a chance to try some experiments, and here it was. I found the queen and put her with a frame of brood into an empty story below. On this I placed a queen-excluder and put the other three stories of brood and honey on top of it. Ten days later I removed all the cells in the upper stories. The foundation in the lower story where the queen was, proved to be all drawn out and fairly well filled with brood and eggs. On going through the colonies a week later I discovered that two of the colonies were starting cells again. With these I went through with the same performance again, but instead of giving the queen one frame of brood below I gave her three or four, as I did not like to remove more brood than necessary to discourage swarming. This I thought had settled the swarming fever for the season and I was almost correct in so thinking. I did not see a swarm until the last part of August, when I found a small swarm hanging out about 4 o'clock in the afternooon. Upon investigating I found one of the colonies had superseded their queen and when the virgin hatched they swarmed.

And now we come to some figures. This is the best part of beekeeping. My best colony produced 125 pounds of extracted honey. My next best colony produced 89 pounds and the others 80, 65 and 59 pounds, respectively. This makes a total of 418 pounds, or an average of 83 pounds per colony. This honey was all sold at home, the purchaser furnishing his own container; 300 pounds of it was sold for 15 cents per pound, 100 pounds for 18 cents per pound, and the remainder for 20 cents per pound. As there were no expenses paid for containers, the net amount I received for the honey was $66.60, an average of a little better than $13 per swarm.

Browerville, Minn.



An Iowa white clover field. H. E. Roth, of Strawberry Point

Why Did These Bees Die?

I had a peculiar experience with one colony the past season which I concluded to tell you about. It came through last winter in good condition. Last spring, when dandelion was in bloom I put on a super of 24 sections. The 20th of May this was filled with honey, so I took it off and put on another super, but before the bees were strong enough to enter the sections the first honeyflow was over. I looked at them several times, but there was nothing doing till the last of August, when I examined them and found a few bees in three or four sections and some of the foundation cleaned out in those sections. I concluded it was so late they would not do much more, so I did not examine them again till a warm day in January, when I noticed no bees flying. I took off the cover and found the sections all filled and sealed with a nice quality of honey. I took off the super and examined the brood-chamber and found the two outside combs filled with sealed honey. The other six combs had honey at the top and ends of the frames and the centers

all filled with brood. There was quite a few empty cells amongst the brood, but the cells were all clean, no unsealed dead larvæ. There was only a handful of dead bees on the bottom of the hive, and only a few straggling dead bees on the combs.

Did those bees die of foulbrood, or did they swarm out late in the fall? There were no dead bees in front of the hive, and I could not find the queen among the few bees that were there.

Please excuse this long story, but I would like to know what the trouble was with those bees, as they must have been good and strong while filling the sections.

S. L. SHERMAN,
Oskaloosa, Iowa.

In reply to your letter and the experience which you had with the colony, the only possibility which I can think of is that your colony might possibly have swarmed late in the fall and then did not get requeened, and so died from queenlessness. From the fact that you found some sealed cells of brood, and these were scattered, I believe these might have been the brood of laying workers.

It is hardly possible that your colony died from American foulbrood, for the simple reason that if they had been badly diseased, they would not have stored honey in sections. I cer tainly cannot think of any other explanation for your query, and I am forwarding your question to Dr. C. C. Miller, of Marengo, Ill., and his answer will appear in the American Bee Journal. F. ERIC MILLEN,
State Apiarist.

When I opened my mail this morning I read aloud the letter of Mr. Sherman, and as I finished reading it, my assistant, Miss Wilson, tersely remarked, "They swarmed." Then I read the copy of Prof. Millen's reply, and it covers the ground so fully that I have nothing more to do than to put my O. K. upon it. What a lucky State Iowa is in the men she has had and has, to lead in beekeeping. And withal this man Millen is such a lovable sort of chap.

C. C. MILLER.

Transferring

I am buying some bees from a farmer. They are in movable-frame hives, but he did not use any comb foundation and the combs are crooked. Now what can I do with these combs? Would you advise removing them and putting in comb foundation? Or can I straighten those that are crooked and splice them out? At what time would you advise me to do this work?

A. A. B., Kingsley, Ia.

Answer. The question which you ask is a very common one, as many people do not see the absolute necessity of securing straight combs in the frames. It is only when they see others handle the bees, helping one colony from another with combs of brood or honey, as the occasion requires, or making divisions, or in fact, manipulating the frames as though they were so many toys, that they realize that the advantage of movable-frame hives is secured only when the combs are as straight in the frames as so many boards, so that there may be neither leakage nor damaged cells. Handling bees, when everything is straight, is fun; handling hives of crooked combs in the frames is worse than handling old gums, or skeps, or box hives.

To straighten the combs, you should drive the bees out of the brood-chamber, at the opening of fruit bloom, into another hive-body, without frames. The hive which contains the bees is then left on the stand of the colony and the hive of combs, minus the bees, is taken into a work room of some sort, where no robbers can annoy. The hive is inverted and the crooked combs are cut loose from the hive walls wherever they are fast. The outer body may then be lifted off. The combs are cut out of the frames and each one of those that contain worker-brood is fastened into a frame, with twine or wire. We much prefer the wires bent at each end a half inch, the bent ends of the wire being driven into the edges of the frames, either horizontally or perpendicularly. At the end of a week the wires may be removed, as the bees, by that time, will have fastened the combs into the frame.

In the olden days, before the use of comb foundation, it was customary to transfer into the frames every piece of worker comb. But drone-comb, of which there is always too much, should be rendered into wax and the empty frames remaining in the hive should be supplied with sheets of comb foundation.

When the combs have been fastened into the frames, the hive is placed on the old stand and the bees are shaken in front of it and they hasten to take possession. If everything is manipulated correctly, it takes less than an hour to transfer the combs, and the brood does not get chilled, especially if the transferring is done within a warm room.

Another and more simple way, but less profitable, is to put a hive full of comb foundation in frames over the top of the hive to be transferred and drive the bees into it, when the crop is on, separating the two stories with a queen excluder so the queen may not go back below. At the end of 3 weeks all the bees in the old hive will have hatched and it may be removed and the combs cut out at leisure.

These methods are given in greater detail at pages 49 to 53 of "First Lessons in Beekeeping" and at still greater length at pages 309 to 316 of the "Hive & Honey Bee, Revised."—C. P. D.

DR. MILLER'S ANSWERS

Send Questions either to the office of the American Bee Journal or direct to DR. C. C. MILLER, MARENGO, ILL.. He does NOT answer bee-keeping questions by mail.

Transferring

When and how is the best time and system of transferring bees from a common box-hive into a modern hive? D. M.

ANSWER.—Wait till the colony in the box-hive swarms. Hive the swarm in a modern hive, setting this on the old stand with the old hive as close to it as possible, both hives facing the same way the old hive previously faced. A week later move the old hive back of the new one, facing the opposite way. Two weeks later still (three weeks from the time the swarm issued), chop up the old hive, giving the bees to the other hive. and melting up the old combs.

Feeding

1. Feeding, do you let it boil, or just come to a boil?
2. I want to feed for early brood-rearing. What is the best way?
3. Do you think it would be a good plan to put feed in a butter bowl and put it where they can get it, when the weather is warm enough?
4. Do you think that I can make beekeeping a success in the south central part of Pennsylvania?
5. Do you think if a man uses tobacco he can handle bees as gently as one who does not?
6. Do you know of any successful beekeeper that smokes a pipe?

PENNSYLVANIA.

ANSWERS.—1. There is no need to make the water or syrup any hotter than necessary to disolve the sugar. If you dissolve it in cold water it will be all right, only hot water hurries the work.

2. The best way is to give combs of sealed honey, if there is not abundance of feed in the hive. If you have no sealed combs, then feed enough syrup at one feed. If there is abundance of food in the hive you needn't fear about brood-rearing going on, and if you feed every day with the idea that you will increase brood-rearing you may do harm instead of good. There is, however, an exceptional place where there is a dearth of pasturage that the queen stops laying entirely. In such a place half a pound to a pound of sugar should be fed every day or every other day, dissolved in an equal quantity of water. But I don't know whether there are any localities of that kind in your State.

3. Yes; only look out that bees do not drown in it. If there are neighboring bees, they will likely share in it.

4. Yes, if you have the right stuff in you.

5. Yes, unless he uses it to such excess that his hand shakes involuntarily.

6. Yes

Foulbrood

1. I have 50 hives of bees, 10 of which have American foulbrood. I know how to shake my bees for foulbrood, rear my own queens and manipulate my colonies in general. After such an outbreak, how many hives would you expect to have the disease next spring, after shaking these 10 this spring? This is my third year and I do not feel much encouraged after finding the American foulbrood. Do you think I would overcome this if I would stay with it?

I run for extracted honey and use the standard Langstroth hives.

2. Do you think it would be safe to shake bees into a hive that had American foulbrood, after removing the old combs and scraping the frames and hives of all the wax and propolis and using full sheets of foundation?

CALIFORNIA.

ANSWERS.—1. Others have come out ahead on American foulbrood, why not you? Of course you can conquer it, although it may be in surrounding apiaries and you may have repeated outbreaks. Aside from the danger from surrounding apiaries, none of the ten treated this year should be diseased next year.

2. I should not hesitate to use hives that had contained American foulbrood, and perhaps the majority would agree with me, although some would prefer to scorch the insides of the hives by burning straw in them. As to the frames, it's such a job to clean them up fit to use again that I believe I would rather use new frames.

Moths

Kindly give your opinion about the vitality of moth worms in the cocoons. A friend of mine had a colony of bees die last fall. He examined them the other day and found live worms in the cocoons. I did not think it possible but he had witnesses to prove it. We have had a few days of zero weather, and many days of cold. I have found it takes much more to kill the cocoons, but had supposed plenty of disulphide carbon would kill them. If freezing won't kill them, why do we always say combs are safe after freezing? It has always been my experience they were.
MISSOURI

ANSWER.—Those worms must have been wrong in their upper story. Any right-minded larva of the bee-moth ought to know enough to succumb to freezing. Seriously, I should hesitate about giving up a rule for a single exception, and I think this is the first time I ever heard of live worms being in combs that had been frozen. In spite of the zero weather, is it not possible that in some way there was enough protection so that there was no freezing in the center of the hive? Yet there is a possibility that there may be rare exceptions to a rule heretofore considered without exceptions.

Hive-Stands—Bottoms—Records, Etc.

1. On page 134 of "Fifty Years Among the Bees" I read of how you boil T-tins in lye water to clean them. Do you think it would be all right for wood separators and for supers, or would it be injurious to the nails?

2. Wouldn't it be good to make hive-stands as you describe them in your book, page 88, and nail a cleat about an inch square on top, in front and back, for the hives to rest on to prevent the hive-bottom from lying flat on so large a surface?

3. I am running for extracted honey. Will it be all right to let the queen go into the super all summer, or is it better to have a queen-excluder between all the time?

4. What do you think is a fair price per gallon to extract honey for my neighbors with a two-frame extractor?

5. Would it be unlawful for me to make Standard dovetail hives with excelsior covers?

6. Do you think a 2-inch deep bottom-board is too deep for outdoor wintering, or will it be all right?

7. Will it not be cool in the hive at night if I have an entrance at each story, as you describe it on page 185 in the book? And how about it when it rains, will I have to go and shove them in place so the water won't run in the hive?

8. Last September I sent for some Italian queens and I killed the old queen and put the cages in the hives on the frames, above the brood. Most of the bees did not gnaw off the pasteboard on the end of the cage. The pasteboard had holes in it, but the bees only filled them with bee-glue. What do you think was the matter?

9. Would like to have you show the record of a colony as you have it in your record book, so I will know better how to keep a record of the bees. ILLINOIS.

ANSWERS.—1. It does no harm to supers or nails, but it makes plain separators of wood curl up badly unless you dry them under pressure.

2. It seems it should work well.

3. It is generally agreed that it is better to use the excluder

4. I don't know that there is anything for a standard. At present prices for skilled labor it should be enough to pay you at least 50 cents an hour, and if you have many bees of your own to care for it may not pay you at that.

5. I think there is no patent to prevent.

6. It will be all right.

7. During the time that supers are on the hive the weather is so warm that no harm comes from these openings, but if a cool spell of several days should come it is easy to lay a little strip at the opening. I have never known any harm come from the rain, although, of course, it must enter at times.

8. That must be a very unusual occurrence, and it may be that there was not sufficient candy to reach near enough the holes in the pasteboard.

9. As you will see at page 38 in the book you have mentionel, an important thing in the record book is to keep track of the queen and the surplus from her or her antecedents. Early in the season the amount of brood is noted, as also the number of broods taken or given. Anything unusual may be entered, but the entries are comparatively few for the average colony. I've been looking through one of my record books to find something that would be a fair sample for you, but no two are alike, and they vary so greatly that no one of them would give you a very full idea. However, I'll give you one of them:

5-12 ,q cl 4 br; 5-29, br in 7; 6-30, 9 br; 7-9, Dem; 7-18, excl; 7-27, kc above.

Short as that is, it might need a good deal of explanation. It may be read thus: May 12 I found the queen was clipped, and there were 4 frames of brood. May 29 there was brood in 7 combs. June 30 there were 9 brood. July 9 I Demareed the colony, putting all but one brood in the fourth story. July 18 I put an excluder over the first story. (The queen had presumably gone up through the two stories of extracting-combs into the fourth story and I put her down and kept her down with the excluder.) July 27 I killed cells in the upper story.

Sections—20-Frame Hives

1. A few of my supers are for section. Is it necessary to have section holders to sit sections in or on, or can I set sections on the excluders?

2. Suppose a fine, large swarm of bees were put in a 20-frame hive and a 20-frame super on top; later on, as they need same, another 20-frame super added; would they swarm before it was all full?

3 When they did swarm, would it be large?

4. I wonder what beekeepers up north think of it being swarming time here in sunny Texas?

5. Why does Mr. Miller not advocate the use of paint on hives?

6. Is there anything at all in a honeysuckle bloom or in a cape jessamine bloom for bees? Both are very fragrant, yet I have never seen bees working on them. TEXAS.

ANSWERS.—1. Bees will fill sections if they are merely set on an excluder, but you will not find it a satisfactory way. Better have some kind of a section-super; but you do not need an excluder if your sections are *filled* with worker foundation

2. Likely there would be no swarming.

3. If a swarm should issue it would likely be large.

4. Northern beekeepers envy you your advantages, yet if all of them should head for Texas it would be rough on northern fruit men to have no bees to fertilize the fruit blossoms.

5. In my locality I think it costs less to get new hives occasionally than to keep the old ones painted, and I think unpainted hives are better for the bees in winter while in the cellar.

6. I think the honeybee cannot reach the nectar in these flowers.

Transferring—Syrup for Bees—Roaches

1. I have 35 stands of bees; 15 are in old hives or square boxes that I recently purchased. Would it be advisable to transfer them middle of April? All have plenty of stores.

2. I have about 20 gallons of maple syrup that is a little old for table use; would you advise the feeding of this to bees after boiling and skimming? I have some in patent hives that need feeding.

3. Some of my hives have roaches in them: how do you get rid of them?
MARYLAND.

ANSWERS.—1. You can transfer during fruit bloom; although it may be still better to wait till they swarm, put the swarm in the new hive on the old stand, the old hive close beside it, then a week later move the old hive to the opposite side of the old one, and two weeks later still break up the old hive and unite the bees with the swarm.

2. It may do to feed it, but look out not to get it in the surplus.

3. Don't allow any place where the roaches can be sheltered against the attacks of the bees. The use of quilts allows a nice, sheltered place for roaches and ants.

The Blessed Bees

Some years ago I had a copy of a book entitled "The Blessed Bees," written (I think) by a Mr. Allen, who was located on a lime-tree belt in Ohio. It was the record of a few years' work of a successful beekeeper. The book was, unfortunately, lost, and I shall be glad if you can let me know where a copy can be obtained. Kindly let me know, also, your opinion of the book. IRELAND.

ANSWER.—I think the book is out of print, and I don't know where a copy could be had. It was a well-written piece of fiction, yet I think it contained nothing impossible.

A Beginner

1. I have been studying beekeeping all my spare time for a year or so. I have read your "Thousand Answers to Beekeeping Questions" twice, and it will be as interesting to read it again. Do you think I will make a success at beekeeping?

2. I am buying 5 colonies of bees at $5.00 each. I would rather go in for extracted honey, but I have some comb honey sections and supers, etc., and will get some with bees; will use full sheets of foundation in sections. Can I fasten them sufficiently with the Parker fastener, and with V wax tube?

3. We are going to move south this fall, probably west Tennessee, Arkansas or southeastern Missouri. Is west Tennessee between the Tennessee river and Mississippi river any good for beekeeping, or is the ground too poor?

4. The only objection we have to this country is the long, cold winters and frosts in late spring and early fall. For bees to work on here we have, first willow-maple; flowers, clover, wild cherry, raspberries, blackberries, buckwheat, peas, goldenrod, etc. Would you consider this a good bee country?

5. Most farming beekeepers around here use only 1-inch starters in sections and in a good year they expect to get 50 pounds, or 95, maybe, sometimes 100. Should I get more? Of course they have had experience, and I have not.

6. I want my bees to make just as much honey as they possibly can, and yet get a good swarm from each hive. Had I better let them swarm naturally and then hive them, as you so often explain, putting swarm on old stand, old hive beside it, and moving in 7 or 8 days (old hive?)

7. Of course I run quite a risk of losing the swarm when I may be working in the field. If I do lose the swarm, then how can I keep them from swarming again?

8. If I had some experience I would swarm them artificially, or divide, or something. Which is best?

9. I am borrowing the money to buy the hives and supplies and want to be sure of getting a crop, if there is any to get.

10. Will the Novice or Cowan two-frame extractor 9⅝ in. wide take a regular Hoffman brood-frame?

11. When I go in for extracted honey had I better use 2-story or same size extracting frames as brood? MICHIGAN.

ANSWERS.—1. If you have twice read through that long string of questions and answers, and still have an appetite for another dose, you certainly show a strong taste for beekeeping and a lively interest therein, and that goes quite a ways toward making a good beekeeper, so I feel quite hopeful of your success.

2. Yes, they can be fastened either way.

3. I am not intimately acquainted with that region, but think you will find good locations there.

4. There seems no good reason why bees might not do well there. To be sure, your winters are severe, but not so much so as mine, and I've stood it for about 59 years.

5. Yes; not only will full sheets of foundation give more surplus than 1-inch starters, but I feel sure that you are, or will be, more up-to-date in other respects, and so will have greater success.

6. The plan you outline is very likely the best for you, at least for now; after you have had more experience you can tell better whether you ought to change to some other way.

7. But you don't need to lose the swarm. Of course you will clip your queens, and then if a swarm issues in your absence you may lose the queen, but not the swarm. At any rate you can kill all queen-cells but one, and then no swarm will issue.

8. Until you have more experience it will be a good plan to use both ways, and then you can better judge which way is better for you.

9. I don't know. A season may be very poor and give you no surplus whatever. It may be remarkably good, and give you 150 to 200 pounds of comb honey, or 50 per cent more of extracted.

10. Yes.

11. You can begin in that way, and any time later on you can change to shallower extracting frames if you think best.

(Northern Michigan is considered a better bee country than Tennessee. Many successful beekeepers in Northern Michigan average 100 pounds per colony year after year. For beekeeping, Michigan is hard to beat. Unless there are other reasons for leaving than to find a location for beekeeping, one had better investigate pretty carefully before making the change.—F. C. P.)

Package Bees

How far can I have bees by the pound shipped satisfactorily? How ship? Which is the best parcel post or express?

SOUTH DAKOTA.

ANSWER.—In spite of the many pounds of bees that have been shipped, the shipping of packages is still somewhat in the experimental stage, and in some cases the highest success is not attained. It is, however, not all a matter of distance, and there may be success between two of the most distant points in the country, and, for anything I know, across the water. As yet express seems better than parcel post, and shipping with a frame of brood is safer than shipping the bare bees.

Queen-Rearing

Referring to your plan for rearing queens—

1. Do you leave just the three frames (two of brood to the one with strips) and leave that empty space each side in the brood-chamber?

2. Could one put the brood taken out onto the top of the same hive, and if put by itself for the few days, will the old bees accept it again?

ONTARIO.

ANSWERS.—1. The combs are put in one side of the hive, a dummy beside them, and the rest of the hive left vacant.

2. Yes.

Bee Paralysis

Last fall, in August I think, I noticed one hive expelling several dead and dying bees. Two or three weeks later the hive next to it became infected, then the third became infected. The first hive is now very weak and queenless the second weak and little brood, though several cells with eggs, while the third has brood in all stages, strong and working good, but lots of bees dying. The sick bees work, or are worked, to the entrance and carried out by remaining healthy bees. A few have distended abdomen, with natural color; others normal in size, but turn a glossy black; others normal in size and color, though with the former, lie or sit unable to fly, and tremble or quiver as if in great pain. What is the matter, and what is best for me to do?

OHIO.

ANSWER.—The trouble is bee paralysis. In the North it is generally not very serious, and like enough by the time this is in print the trouble will be all over. Many cures have been proposed, and perhaps as good as any is to give the bees wholesome food, if they have not already obtained it from the flowers.

Traps—Mating

1. Does it do any harm to use queen and drone traps on the hives during swarming season?

2. When a colony swarms and you kill its queen and you hive them back in the old hive, can I leave the queen-trap on, to catch the queen of the second swarm?

3. Does the queen of the second swarm mate before or after swarming?

MICHIGAN.

ANSWERS.—1. It is better not to have a trap on the hive except when actually needed. It no doubt annoys the bees to be obliged to go through the perforations, and it certainly is a hindrance to the free entrance of fresh air.

2. You might trap the virgin queen, but I'm afraid you might get into trouble by it, and possibly cause the bees to kill her.

3. I don't know for sure; I think after or during swarming.

Nectar From Dandelions

Do dandelions yield nectar in Michigan?

ANSWER.—Yes.

Requeening

How would you proceed to requeen, and when is the proper time? Must the old queen be removed before putting in new one? I have mixed bees—some are Italian.

PENNSYLVANIA.

ANSWER.—As a rule I wouldn't requeen at all; and never unless I could requeen with a better queen. Other things being equal, I would buy a queen for requeening toward the last of the season, and introduce her according to the accompanying instructions, killing the old queen before introducing. Still, if I wanted to breed from her as soon as possible, I might get her earlier in the season. But generally it is not so easy to get queens very early, and they cost more.

Entrance Depth—Swarm Control—Package Bees

1. If I use a bottom-board 1½ inches deep under ten-frame hives (bees run for extracted honey) will they trouble by building down? Is this entrance too deep?

2. What system of swarm control do you consider most reliable when running for extracted honey? I would be glad to adopt a system that would permit a reasonable increase and at the same time give a good crop of honey. Bees are taken from cellar here about May 1, and honey crop begins about July 1.

3. If 2-pound packages of bees are placed in hives containing two frames of foundation and one frame of honey, will the bees "stay put," or insist upon swarming out for lack of brood to hold them? I have little brood to give them at the start. If I shut off most of hive-space with division-boards for these bees, will it do to allow frames of foundation to remain in remainder of hive, to be included as needed, or shall I put the frames in as bees require them?

4. If I place package bees in hives (10-frame size), pack warm during May and, in addition to the comb of honey they have, feed an Alexander feeder full of warm syrup twice a week, will there be any trouble about their failing to draw combs and build up for the flow July 1?

MAINE.

ANSWETS.—1. They may be depended upon to build down in so deep a space, or in any space more than about three-fourths of an inch deep.

2. The Demaree plan, or some variation of it, might suit you. As soon as there is danger of swarming, put all but one brood in an upper story, leaving the queen below with the one broood, having an excluder between the two stories. At the same time destroy all queen-cells above, and again 7 or 8 days later.

3. They might stay all right without brood, but sometimes they will swarm out when hived. It would make matters safer to leave the queen caged for perhaps 2 days.

It will be all right to have the frames of foundation in the unoccupied part.

4 Likely; but they will do better with a heavy natural flow, in which case no feeding will be needed. This refers to packages of 2 pounds.

Queen Cells

In your "Thousand Answers" I find on page 134 in regard to increase: "If you find queen-cells in an upper story, let it stand another 5 days and then set it on its new place, giving it a queen-cell from one of the others." Now I should like to know why to give them a queen-cell from another hive; why would not the one they have be good enough for them?

CALIFORNIA.

ANSWER.—It will be good enough unless you can give one that is riper or of better stock.

Judging Location—Wintering

1. What can one do to estimate the worth of any part of this country for honey production?

2. Every once in a while one reads about wintering a colony of bees on so many frames, less than ten, in a 10-frame hive. This is all right if the remaining combs are all full of honey. Over half of the time, with me, frames are but partially filled with honey; so that all the ten are thus required for the bees to get through with. What is the good of advice that cannot be followed?

3. I am just through first examination of my bees and amongst other things, have equalized stores. When such examinations are made, do you ever lacerate the cappings of combs? I have a 12-frame colony that is rich in bees, but was lacking in stores. I gave it 4 frames of honey, all on one side of hive; would you have placed it otherwise?

PENNSYLVANIA.

ANSWERS.—1. I'm afraid I wouldn't make the most successful prospector for honey locations. If, however, I were forced to it I would look around and see whether there was plenty of white clover, basswood and other sources of honey with which I was familiar. That would work all right if I didn't go far from home. But when I got where the chief honey-plants were all new to me, I'd have to inquire what they were, and in most countries depend on the aid of an interpreter. Then I should try to find out what success resident beekeepers had, taking into consideration the up-to-date plans, or the contrary. Indeed, I think I should make inquiries before doing any looking for myself. Even before anything else, I think I should try to find out whether it was a fair field for me to try to enter, or whether it was already fully occupied by those upon whom it would be wrong for me to intrude.

2. I've read your question several times, and I'm afraid I don't quite get its bearing. Anyway, any advice as to wintering on any certain number of combs, with no thought of the amount of stores in them, is, as you intimate, foolishness. I didn't suppose, however, that

such advice was common. But if I have not got at the spirit of your question, I'll be glad to try again.

I don't find it necessary to do any uncapping, the bees without it having all the brood they can cover. I don't suppose it would make much difference where you put those 4 frames of honey, so long as you did not separate frames of brood by them, for after bees are flying freely they will find honey in any part of the hive.

Granulation of Honey

Why, in candying, is some honey coarser than others? I should like to know what honeys granulate with a fine grain and what with a coarse grain. ONTARIO.

ANSWER.—I really know very little about it, but it may be that exposure of my ignorance may bring out the information from someone who does know. I suspect that there is a difference in the honey itself, the honey from one plant having a finer grain than that from another. But it is likely a still greater difference is due to the conditions under which the honey candies. The temperature, the ripeness of the honey, and other items, may play a part. One thing I know is that if honey be stirred occasionally when candying it will have a finer grain than if allowed to stand perfectly still. Also, the stirring will hasten granulation.

Mating Queens

If I find queen-cells in a hive when there are drones flying, and I move the hive away and put in its place another hive, with honey and one ripe queen-cell, and after the queen is mated on the old stand give them back the brood and young bees from the old hive, will I lose any honey? IOWA.

ANSWER.—I don't know. Much depends on what happens afterward. If, on the one hand, the young queen is successful in mating and laying, and the old hive stands close by so that all its force unites with the new hive when the old hive is taken away; and on the other hand, if the bees are left entirely alone to swarm all they like, then it may be that you will gain rather than lose by the proposed plan.

Demaree Plan

What is the Demaree plan to prevent swarming?

ANSWER.—It is a plan devised years ago by G. W. Demaree, of Christiansburg, Ky. Put all frames of brood in an upper story over an excluder, leaving the queen below with frames of drawn comb or frames filled with foundation. At the time of doing this, kill all cells found in the upper story, and do the same a week or ten days later. As the brood emerges from the cells in the upper story the cells will be filled with honey, and the combs will become extracting combs, while the bees and queen in the lower story will be in the condition of a natural swarm, and will proceed accordingly.

The usual time for this performance is any time after queen-cells are started, and before the bees have swarmed. It may, however, take place at any time near swarming time, even if no cells are found; and it may take place after a swarm has issued and returned.

In some cases the bees have swarmed out when left without brood in the lower story, so now it is the custom to leave one brood below, preferably one with the least brood.

Instead of putting the brood in the second story, many prefer to put one or two stories of extracting-combs over the excluder, and the story of brood still higher.

BEE-KEEPING FOR WOMEN

Conducted by MISS EMMA M. WILSON, Marengo, Ill.

Captured Swarm

A few days ago we found a large swarm of bees on a tree in the woods. We undertook to catch them, and sawed the tree down. They settled again on one of the limbs. We waited until dark, then sawed off the limb and shook them into a box. We had no hive.

The bees do not work at all. I peeped into the box this morning and they are just piled up in a corner, fully a quart of them.

1. Do you suppose the queen was killed?

2. How can I tell if there is no queen?

3. A neighbor said to shut them in and they would make a queen. Will they?

4. Could I take a queen from another colony and put with them? If so, how would I go about getting her? FLORIDA.

Answers.—1. The queen may or may not have been killed. Bees are freaky creatures and sometimes sulk even when the queen is with them.

2. You can tell the queen is present by finding eggs in worker-cells. That's difficult in your case. If you find the bees building worker-comb, you may know they have a queen.

3. Your neighbor is mistaken. If there is no queen and no eggs or young brood there is no hope for them to raise a queen.

4. Yes, if you are satisfied they have no queen you can buy one from any of those who advertise in this journal to sell queens, and directions for introducing will accompany the queen.

Helps for a Beginner

1. I am a new beginner at the work and would like to study it up so as to make a success of it some day. Can you tell me some good book or magazine to get?

2. I live in town, so do not have a very large place, but one part of the lot has trees and berry bushes, and I wondered whether there was anything that would grow there that would be better for honey than clover. We have used it for a chicken yard, so is nothing there now.

3. What are some of the best flowers for honey?

4. Last spring I had two swarms and each one swarmed twice, but I only got three of the swarms, and one of them left after I had it in the hive, so I have only four swarms now; but they look pretty good these bright days. When a swarm comes out how do you get them to alight without going away?

5. Why, do you suppose, did the one swarm leave after I had it in the hive?

6. What is a good kind of hive to use, and what is a good company to get bee supplies from?

7. Do you put the top boxes on right away in the spring?

8. Do you feed the bees ,or how could they get enough to average 265 pounds to each hive? ILLINOIS.

Answers.—1. You cannot go amiss to get the American Bee Journal, a copy of which is sent you, and in the list of bee-books you will no doubt find the suitable book. Gleanings in Bee Culture, Medina, Ohio, and the Domestic Beekeeper, Northstar, Mich., are also good journals. But don't think of getting a bee journal without a bee-book, and if you cannot have both, be sure to have the book.

2. Your bees will go a mile or two in all directions to forage, and it would take many lots like yours to support a single colony. So don't bother about trying to plant anything for them.

3. White clover is likely the most important honey-plant in your locality. There may also be basswood, raspberry, alsike and sweet clovers, fruit blossoms, dandelion, heartsease, and others.

4. Don't do anything. Some people make a racket by pounding on tin pans, but it doesn't do a particle of good. The bees will settle of their own accord, unless the wings of the queen are clipped, in which case they may settle, or they may return to the hive without settling.

5. Like enough the hive was close and perhaps standing in the sun, and the bees left because they didn't want to live in so hot a place.

6. The 10-frame dovetailed hive is perhaps most common, but some good beekeepers think it too small, and prefer the Dadant or other large hive.

7. No, supers for surplus are not put on in your locality till the first white clover blooms.

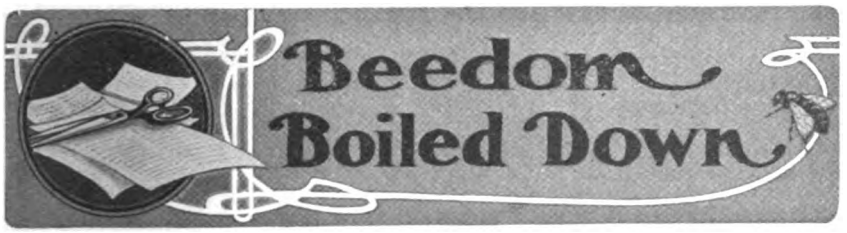
8. You are referring to Dr. Miller's record crop of 266 sections per colony, which would be only 244 pounds per colony, in which case there was no feeding; the bees got their supply from the surrounding fields.

March Snow in New York

Yesterday, last night and today, up to this time (noon), it has been snowing, and the wind has been blowing the worst I ever knew it to be in March. As near as I can judge about 8 inches of snow, but it is bare ground or in heaps.

My bees, 3 apiaries, have all been carried out of cellars and had a good cleansing flight. Only one colony dead; don't know what effect these two days of snow and wind (the thermometer 16 above zero) will have on them. N. D. WEST.

New York.



Saving Weak Colonies

IN looking through my bees this spring I found three colonies that had only about a handful each of bees, but the queens seemed to be good; and, as I wanted to save them if possible, I took queen-excluders and covered them with wire-cloth and bored a three-eighth-inch hole in the hives for entrances. I placed the weaklings over strong colonies with these screen-covered excluders between the two hive-bodies and gave them each a frame of hatching-brood. About a week later I took the wire-cloth off, and now they have three frames of brood each. As soon as the dandelions begin to bloom I will separate these hives. I think in this way I have saved the queens and at the same time have built up three good colonies of bees that will store me some surplus honey, as our main honey-flow starts about the 10th of June. The dandelion promises a good crop here to build the bees up on, and sweet clover and alfalfa are coming on in good shape, so everything points towards a good crop this season.

CURTIS WHARTON, Juntura, Ore.

Increase

I HAVE a number of colonies of bees at my old home, about 100 miles from here. Having no source of honey and pollen here for the bees to build up on till about June 20, when there will be an abundance of alfalfa and sweet clover, I thought to leave them where they are now and let them build up on fruit blossoms and dandelion, and then bring them here in combless packages, leaving enough bees in the hives to take care of the brood and build up to a strong colony again.

I intend to bring them here on a truck or automobile and make the trip over night, if need be, on account of heat. What I want to know is whether I can put the bees of a whole colony in one box, or would it be better to have smaller packages? Please give me the best way to do it.

ALFRED DURTSCHI,
Myton, Utah.

Answer.—The method you propose would be practical, if it is your intention to make increase in preference to honey. The taking of the bees in an empty hive would be all right, if you arrange to give them air, say by placing a screen over the top in place of cover, for the trip. We would recommend hauling enough combs of brood to give each colony one on arrival, to prevent their deserting the hives, as the trip might cause them to wish to leave.

Some eastern beekeepers practice a similar plan by having apiaries in the South from which they remove the bees prior to the northern honey-flow, leaving the brood and sufficient bees to keep it warm on the old stand with which to build up the colony.

However, the transportation of your bees in full colonies at the date you mention should give you no difficulty, if you transport them after night and give them plenty of ventilation by placing an empty super over the hive and leave the top open with a screen for air.

A Safe Feeder

I think I have developed a convenient, safe device for feeding bees, either out of doors, on thin syrup, or over the brood-nest.

Make a shallow box of wood or metal, any depth, and in it put a piece of galvanized window screen bent like the bellows of a photograph camera, into a series of V's, thus: VVVVVV.

Using it I find it necessary to punch holes, large enough for the bees to pass through easily, in the top of the ridges. To do this quickly and easily bore a hole in a board, and with an iron point punch the holes, resting the wire over the hole in the board. With the holes in the wire, which should be about an inch and a half apart, the bees will not get under the wire and drown, but it will be as well to have the wire V's fill the box from side to side.

A strip of wire cloth as wide as the box will take about 18 inches for every foot of length, if the V's are 1½ in hes deep and the same from apex to apex of the ridges. The wire may be bent simply by folding it on itself.

I have tried this out thoroughly this spring, and after putting the holes in as described above have lost not a bee by drowning.

DR. BONNEY.

Goldens

YOU know what claims have been and are being made by some breeding Goldens. I want to be fair or nothing, and so far, with many tests up to 1917, not a single Golden queen has proven worth while for me. Have many good friends among breeders who object to my unbiased statement, and I promised to test once more and for all the respective merits of the 3-banded vs. Goldens.

Golden queens secured the past season produced bees that were golden all over, and a type that was new to me—up and doing every minute, very prolific, full of pep and energy, flying and working under adverse conditions, losing no chance to gather stores even if they had to steal them—and had concluded that at last some Goldens were up to representations. But wanted to see how they wintered, as it was the apparent lack of vitality in wintering and in early spring that heretofore proved their undoing, but the weather was against the thoroughness of the test. So far they have lost more numerously than the darker race, but are still active and may build up fine when real spring does come.

Have to acknowledge that this is no final test, but am from Missouri, and will have to be shown.

E. J. Ladd, Portland, Ore.

Hawkins to Wisconsin

MANY of our readers will be interested in the announcement of the G. B. Lewis Company to the effect that Kenneth Hawkins has been placed in charge of their experimental apiaries and the information desk. He will answer the questions asked by their customers and endeavor to assist with such problems as are brought to him.

Mr. Hawkins was for some time engaged in queen rearing in Illinois and later spent some time in extension work for the U. S. Department of Agriculture. His extensive travel in extension work added to his practical experience as a honey producer and queen breeder should fit him well for his new position.

The G. B. Lewis Company is one of the largest bee supply manufacturing concerns in the world. The addition of an experimental and information department will enable them to make tests of new equipment in their own apiaries and to render much practical assistance to their customers.

Honey From Corn

I SEE by the March Bee Journal that Mr. Roose, Mr. Van Ronzelen and Mr. Kaler claim to have gotten corn honey. I believe Mr. Ronzelen saw the bees gathering a sweet juice from the corn cob, as he says, and possibly Mr. Roose and Mr. Kaler are right in their belief that they secured corn honey, but I believe from my observations that they are mistaken. I have kept bees in Michigan about 45 years, and six years here in Minnesota, and there

has been scarcely a year that I have not watched to see if the bees ever gather honey from the corn tassel, and during all of my beekeeping I failed to see bees gathering honey from the tassel. I saw them one year sucking at the root of the leaf next to the stalk. Wm. CRAIG,
Aitkin, Minn.

More About the Central Plant

A WISCONSIN beekeeper asks Morley Pettit, of Ontario, for further information regarding the central plant, as follows: (See Mr. Pettit's articles in the April and May, 1918, issues.)

"We are just starting some outyards. As we live in town, where we have the buildings, power, light, heat and gas, we expect to do all our extracting in one central plant. In one yard we have 100 colonies, and to extract eight tons of honey, as we did last season, it is a rather stiff job to do by hand. We must bring all the honey to town anyhow to pack and ship, but some say not to haul the combs on an auto truck for fear of breaking them. Our season lasts from April till the time frost kills the goldenrod. Any further information about the central plant will be appreciated."

Replying to your favor of recent date, do not know that I can add much to what has been published in the American Bee Journal under my name with reference to extracting equipment. From what I gather from your letter your conditions are more favorable for trucking supers home to extract than ours. We now have four hundred colonies with three outyards, 3½, 8½ and 10½ miles away. More will be established this season, and the beauty of it is we do not need to care whether the new locations have bee-tight houses or houses of any kind, for that matter. Our roads are only fairly good, and with lots of hills; yet for reasons which develop as the system does, in addition to the ones which are manifest, we would not think of decentralizing again.

Our frames are staple-spaced, but spread in supers. We have no trouble with breaking where the load is sufficient to cause the springs to function properly Sometimes we have to crowd combs together and put in the extra comb to prevent swinging. One point, all tob-bars are reinforced by driving a nail down from the top close to each end and clinching to prevent splitting off the lug. This has to be done before nailing up the frames. Even without this very little splitting occurs where the driver is reasonably careful. We have a Ford truck and find it very satisfactory for a load up to three thousand pounds. If we had not the steep hills we would use a trailer in addition.

Of course you will have to make up for small buildings by having enough space at home. Our building, put up in 1917, is 24x40 ft, with upper story and attic. It was built with the intention of tearing down the small barn which was on the place when we moved here. We can't spare the barn until we build at least as much more capacity, and then it will be arranged for extensions as needed. You see we count on super capacity for the whole crop, and when they all come home there has to be some place to put them, besides carpenter-shop, honey room, etc.

MORLEY PETTIT.

How Many Trips to Fill a Cell

Page 61, February issue American Bee Journal: "How many trips are necessary for a bee to fill a cell with honey?"

It would depend somewhat on whether the cell was worker or drone size, also the length of it. I distinctly remember when my father kept bees in box hives with an inch auger hole in the top, over which were placed small boxes in which the surplus honey would be stored and when filled the honey cut out and boxes returned and refilled and we in this crude manner received some very choice combs of honey. One of these boxes, 12 inches in length, 6 inches high and 8 incher wide, was filled with one piece of comb running lengthwise and filled with basswood honey and nicely capped over by black bees. Combs built thus would require several trips at least for one bee to fill a cell. As to 20,000 trips being necessary to store a pound of honey I very much doubt, unless 75 per cent of it was moisture to be evaporated, and that would surely mean some bees in a hive in which 20 pounds or more were being stored per day, and also a good many trips for each field-worker. I would put it about one-fourth of 20,000 trips, waiving evaporation. If the estimate of 5,000 empty bees is correct per pound, my estimate has always been that during a good honey-flow a bee would at least carry her own weight in nectar, and if anyone can tell us what the evaporation would be we would all be glad to know it, and should it be 50 per cent, if my estimate is correct, then we could cut the 20,000 trips in half, which would surely be nearer correct.

ELIAS FOX, Wisconsin.

(Our correspondent is mistaken in believing that a bee can carry her own weight in honey or nectar, although this statement has already been made by others. These are mere guesses, but experiments have been made which give actual facts. L' Abbe Collin, a careful experimenter of the middle of the past century, reported that it takes 5,100 bees to weigh a pound in ordinary conditions. When they were in the swarm, filled with honey, it took only 4,300. Bernard De Gelieu, previously had placed the extreme limits of the number of bees in a pound, when full, at 3,640, and when empty of honey at 5,460. This would indicate that the extreme limit of a bee's capacity for honey is about half its own weight. But the average is much less, according to the careful experiments reported by Professor B. F. Koons in the A, B, C & X, Y, Z of Bee Culture. The conclusion arrived at in these experiments is that 10,000 bees **may be** able to carry a pound of honey or nectar, but that the average number of bees or trips required must be close to 20,000. The Collin figures would bring the number nearer 25,000.

Of course, in all this, the liquid carried must be nectar. Its evaporation after it reaches the hive is another matter and has no influence on the carrying power of a bee.—C. P. D.

Interesting Plant Books

We are in receipt of two very attractive little books which will be helpful to those interested in determining the identities of trees and shrubs. Both are bound in flexible leather, pocket size, which makes it very convenient to carry them about. One, entitled "Winter Botany," is designed especially to enable the students to identify trees and shrubs during the winter months. This contains 434 pages, and sells for $2.50. The one designed for identification during the summer months is entitled "Plant Material of Decorative Gardening," and contains 204 pages, and sells for $1. Either of these books may be obtained from the author at prices named, William Trelease, Urbana, Ill.

Beekeeping in Florida

Beekeeping can be made very profitable in the south, if the bees are properly protected against their natural enemies.

I find that if the bees are put in a shady place they will do 100 per cent better, in the way of producing.

Ants will also try to eat the colony, if not prevented, and especially is this the case with light, or sandy soils.

To keep ants from the hives, place a platform about 3 feet from the ground, and thoroughly coat the 2x 4s or lumber connecting it with the ground, with thick coal tar.

If no coal tar is available, see that the legs of the posts are put in kerosene oil, and from time to time place new oil, as the ants will often try to bridge even the oil, after it has lain in the can some time.

Being above the ground, keeps the hives cooler, and out of reach of many a predatory animal, and if the posts are well coated, from time to time, or new oil is placed in the cans under the posts, it will be found that bees will seldom be molested.

B. YORKSTONE HOGG.

Yellow Jackets

In the last issue of the American Bee Journal Doctor Miller, in regard to yellow jackets bothering bees, says: "I can't help you much." I find the yellow jackets can be easily disposed of. I take fly traps made out of wire-screenings, and bait them with meat. In a few hours they will be full. I then drown the pests in a pail of water and feed them to the chickens, which are very fond of them. ALFRED CARLING,
California.

Pennsylvania Meetings

The newly-organized Montgomery County Beekeepers' Association held a very successful out-door meeting at the apiary of Mr. J. S. Shaeffer, Trooper, Pa., Saturday afternoon, May 3. More than thirty were present, a large portion being ladies.

On June 14, the Philadelphia Beekeepers' Association and the State Association will hold a combined meeting at the School of Horticulture for Women at Ambler, Pa., and on June 28 a combined meeting of the Philadelphia and Montgomery County Beekeepers' Associations will be held at the apiary of Mr. Wm. Wakeman, Washington Square, Pa. These meetings will be held during the honey-flow from clover, when the bees will be very busy, and much of interest to all beekeepers can be demonstrated.

CHAS. F. HOSER, Sec'y.

St. Louis Meeting

The St. Louis County Beekeepers' Association will meet at the home of Chairman A. Beckard, in Webster Groves, Mo., on June 21. Mr. Beckard will talk on Foulbrood—Cause, Prevention and Cure. Mr. Ormond, the Government specialist, will also be present and speak.

Death of Eugene Secor

As we go to press a news dispatch conveys the word that Eugene Secor, of Forest City, Iowa, was gored to death by a bull on May 14. This will be sad news to his many friends among our readers. An extended notice will appear in a later issue.

Notice of Field Day Meeting

A field meeting of beekeepers will be held under the auspices of the Colorado Honey Producers' Association on Saturday, June 14, at Greeley, Col., at Island Park. A large attendance is expected and a good program will be provided. We expect several beekeepers of national reputation to be present at this meeting and give some interesting talks. The Greeley beekeepers will provide refreshments and will also have automobiles at the trains to meet beekepers that may arrive by train. Everyone interested in beekeeping who can arrange to be present at this meeting is cordially invited to come. C. H. WOLFE,
Chairman Entertainment Committee.
FRANK RAUCHFUSS, Secretary
Colorado Honey Producers' Association.

Finding a Queen

I see in the April number a question asked from Oklahoma, "How to Find a Queen," on which I would like to give my experience: I had 6 queens arrive in one lot, thinking it would be easy to find the old queens after reading how to do the trick; but alas, I had about as good luck as Oklahoma did. So, after trying in vain to hire a beekeeper to help me find the queens, I was told to put an empty hive on the old stand, set the old hive beside it, place an entrance guard in front of empty hive, then shake the bees off from the combs in front of new hive, placing combs in empty hive after shaking all bees off. The workers will go in the new hive, as their combs are there, but the queen will be found trying to go through the guard. J. ALLEN BELL.

CLASSIFIED DEPARTMENT.

Advertisements in this department will be inserted at 15 cents per line, with no discounts of any kind. Notices here cannot be less than two lines. If wanted in this department, you must say so when ordering.

BEES AND QUEENS

ITALIAN QUEENS AND NUCLEI—
Untested queens, $1; tested, $1.50; select tested, $2.50.
1-Frame Nucleus, $2.25; 2-frame, $4.00.
1-lb. package of bees, extra, $2.25; 2-lb. package, $4.00.
A trial order will convince you of their merits. H. A. McCarley, Mathis, Tex.

FOR SALE—Italian queens, carefully raised from some of the best stock. Just hatched, 75c; untested, $1. Orders booked now for summer and fall. James McKee,
Riverside, Calif.

FOR SALE—One of the best queen breeders in the United States is now raising queens for us from selected stock of leather-colored Italians. We offer warranted queens at $1 each, or $90 per hundred. Tested queens $2 each. Satisfaction and safe delivery guaranteed. Queens ready now for immediate delivery. Order now, as our supply is limited.
The Foster Honey & Mercantile Co.,
Boulder, Colo.

FOR SALE—Fine Italian queens, untested, $1 for one; $5.50 for six; tested, $2 for one; $9 for six; tested by return mail, untested ready June 1 to June 10.
R. B. Grout, Jamaica, Vt.

FOR SALE—Golden Italian queens, untested, $1 each; tested, $2.
J F. Michael, Winchester, Ind.

FOR SALE—Bees, $12 per colony; Cowan Rapid extractor, $23.
Lorenzo Clark, Winona, Minn.

FOR SALE—Italian queens of "Windmere" are productive and gentle. Untested, $1 each; six for $5.50. Prof. W. A. Matheny,
Ohio University, Athens, Ohio.

I. F. MILLER'S STRAIN Italian Queen Bees for sale. By return mail after June 5 to 10, or your money back. Northern bred, for business, from my best superior breeders; gentle, roll honey in, hardy, winter well, not inclined to swarm; leather color or 3-banded. Queens a specialty; 25 years' breeding experience. Safe arrival and satisfaction guaranteed. Untested, $1; 6, $5.50; 12, $10. Select untested, $1.25; 6, $6.75; 12, $13.
I. F. Miller, Brookville, Pa., R. R. No. 2.

FOR SALE—Leather colored Italian queens, tested, June 1, $1.50; untested, $1.25; $13 a dozen. A. W. Yates,
15 Chapman St., Hartford, Conn.

FOR SALE—Three-band Italian queens, untested queens $1.25 each, six $6.50, twelve $11.50; tested queens, $2.50 each.
Robert B. Spicer, Wharton, N. J.

QUEENS—Ready for delivery now; pure Italian queens, either 3-banded or golden, one, $1.25; six, $7; twelve, $12; 50, $47; 100, $90. Select tested, $2 each. Safe delivery guaranteed. George W. Brown,
Lynnhurst Apiary, Wilson, Wis.

100 COLONIES in 8-frame hives with one super each, for sale, or would work on halves with good man. Location fine.
Mrs. T. H. Carruth, Big Bend, La.

ITALIAN QUEENS—Northern-bred, three-banded,, highest grade, select, untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness and perfect markings. Price, one, $1; twelve, $11; fifty, $45. Send for circular.
J H. Haughey, Berrien Springs, Mich.

FOR SALE OR EXCHANGE—Bees in nucleus lots. F. T. Hoopes, E. Downingtown, Pa.

FOR SALE—Michigan bred Italian queens; am now booking orders for June 15 delivery; 3-band only; untested, 1, $1; 12, $10; 100, $80. Tested, $1.75 each.
D. A. Davis, North Detroit, Mich.

FOR SALE—Apiary of 100 strong colonies equipped for xtracted honey, fine location; 500 full-depth supers, 100 shallow supers, 120-acre homestead, relinquishment goes with the bees; everything new and in fine condition. If interested, write for complete list and price.
J. B. Douglas, Box 1085, Tucson, Ariz.

FOR SALE—Hardy Italian queens, 1, $1; 10, $8. W. G. Lauver, Middletown, Pa., R. 3.

FOR SALE—Goldens, untested, 1, $1.25; 6, $6.50; 12, $11.50. S. A. Tyler, Emden, Ill.

THE EDSON APIARIES will have a surplus of A No. 1 laying Italian queens after May 1, leather colored or goldens; prices reasonable. Address Edson Apiaries prior to June 1, Biggs, Calif. After June 1, West Butte, Calif.

FOR SALE—150 colonies of bees in Iowa, mostly Italians. One 4 and two 2-frame extractors, storage tanks, empty hives and supplies, in good condition; will sell as one lot, or part No disease. Reason for sale, leaving the State. F. Eric Millen,
State Apiarist, Ames, Iowa.

THREE-BANDED ITALIANS ONLY — Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. H. G. Dunn,
The Willows, San Jose, Calif.

GOLDENS that are true to name. Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. Garden City Apiaries,
San Jose, Calif.

FOR SALE—Bright Italian queens, $1 each; $10 per doz. Ready April 1. Safe arrival guaranteed.
T. J. Talley, R. 4, Greenville, Ala.

BEES AND QUEENS—When you can't get them from others you can from us. 1 lb. package, $2; 2-lb. package, $3.75 Queens, $1 each, $11 per doz. Good stock; no disease; order quick. Special prices on nuclei.
Pelican Apiary, New Orleans, La.

Head your colonies with Simmons' Famous Italian Queens. They took first premium at New York State Fair last September. Goldens or three-bands: 1, $1.50; 6, $7.50: 25, $30. Orders booked now and filled in rotation. Also nucleus from same stock ready for June delivery. Allen R Simmons,
Fairmount Apiary, Claverack, N. Y.

J. B. BROCKWELL'S Golden Queens, untested, May, June and July, $2 each; six, $7.50; doz., $14; tested, $4 each. Breeders, $5 to $20 each; 3-f. nuclei with tested queen, $9.
Barnetts, Va.

GOLDEN ITALIAN QUEENS — No better honey gatherers anywhere at any price Untested, $1; tested, $2.
Wallace R. Beaver, Lincoln, Ill.

FOR SALE—3-band Italian queens ready June 1. Untested, each $1; twelve, $10; 100, $80. No disease here and satisfaction guaranteed. A. E. Crandall & Son,
Berlin, Conn.

LEATHER and all dark colored Italian queens, when we have them, mated, $1 each. These queens will include all that are not up to the standard in our goldens, but will be good utility stock. C. W Phelps & Son,
No. 3 Wilcox St. Binghamton, N. Y.

SWARTS GOLDEN QUEENS produce golden bees of the highest quality; satisfaction guaranteed. Mated, $1, 6 for $5; tested, $2.
D L Swarts, Lancaster, O., Rt. 2.

FOR SALE—3-band Italian queens from best honey-gathering strains obtainable. Untested queens, $1.25 each; 6, $6.50; 12, $11. Satisfaction guaranteed. W. T. Perdue,
Route No. 1, Fort Deposit, Ala.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you desire. They are great honey gatherers, beautiful and gentle. Virgin, $1; mated, $2. C. W. Phelps & Son,
3 Wilcox St., Binghamton, N. Y.

QUEENS FOR SALE—Quirin's hardy northern bred Italians will please you. All our yards are wintered on summer stands. Tested and breeders ready any time weather permits mailing. Untested about June 1. Orders booked now. Testimonials and price list for asking. Have been a commercial queen-breeder for more than 25 years.
H. G. Quirin, Bellevue, Ohio.

OUR BRIGHT ITALIAN QUEENS will be ready for shipment after April 15. Untested, 75c each; half doz., $4.50, or $8 per doz. Select untested, 90c each; half doz., $5.50, or $10 per doz. Tested, $1.50 each. Safe arrival guaranteed.
Tillery Bros., R. 5, Box 1D, Georgiana, Ala.

THE AMERICAN BEE JOURNAL is prepared to furnish printing for beekeepers. High quality, prompt service and satisfaction. Our shop is in charge of a man who specializes in printing for the honey producer. Send for our catalog of honey labels, stationery, etc.
American Bee Journal, Hamilton, Ill.

GOLDEN ITALIAN QUEENS and bees; honey-getters, prolific and gentle. Bees by the pound. Write for prices.
J. W. Rice, Box 64, Fort Smith, Ark.

BEES AND QUEENS from my New Jersey apiary. J. H. M. Cook,
1Atf 84 Cortland St., New York City.

FOR SALE—Pure 3-banded Italian queens, as good as you can buy with money, from June 1 to September 1.
J. F. Diemer, Liberty, Mo.

FOR SALE

FOR SALE—One No. 15 Root's auto reversible honey extractor; good as new; takes 2 L. frames; best offer. Also, a few 8-frame dovetailed one-story hives and bodies, one-half current prices; some good worker-brood and extracting combs, at 10c each.
Theodore Fluegge,
33 N. Elgin Ave., Forest Park, Ill.

FOR SALE—Nearly new 25-22 cal. repeating rifle; Marlin model 94; will trade for extractor. Carl Franke, Mauston, Wis.

FOR SALE—Barnes No. 4 saw; good running order; 4 saws; first check for $42 gets it.
R. E. Hammond, Bethune, S. C.

FOR SALE—500 second-hand 60-lb. honey cans in good condition. John Kneser,
R. 1, Hales Corners, Wis.

FOR SALE—Bee hives, supers, sections, smokers, bee veils. Foundation and bee books illustrated. Catalog for stamp.
J. J. Fitzgerald, Mitchell, S. D.

FOR SALE—Clover and buckwheat honey in any style container (glass or tin). Let us quote you. The Deroy Taylor Co.,
Newark, N. Y.

HATCHING EGGS—Plymouth Rocks, all varieties; Anconas and Rouen ducks. Illustrated catalog 8c.
Sheridan Poultry Yards,
R. 18, Sheridan, Mich.

FOR SALE—Frame nailing device. You can make very satisfactory and simple device. Send 50c for drawings showing construction and operation for nailing Hoffman frames; use idea for nailing any style of frame.
Clarence Aldrich, Santa Barbara, Calif.

FOR SALE—Cedar or pine dove-tailed hives; also full line of supplies, including Dadant's foundation. Write for catalog.
A. E. Burdick, Sunnyside, Wash

FOR SALE—40,000 pounds of No. 1 extracted clover honey and 35,000 pounds of aster honey; both of extra light color, heavy body and fine flavor, in 60-lb. cans.
W. B. Wallin, Brooksville, Ky.

FOR SALE—25 10-frame hives, never been used, full sheets foundation.
30 lbs. foundation brood and surplus.
15 feeders.
70 10-frame queen excluders.
100 comb supers, 10-frame.
2,500 sections, 4¼x4¼x1⅞.
Five to six hundred extracting supers, with combs; no disease. E. Keister, Clarno, Wis.

FOR SALE—Silver Spangled Hamburg eggs and fine, rare old Paganini violin for sale.
Elias Fox, Union Center, Wis.

FOR SALE—A limited number of bees and queens for May delivery from either home apiaries or South Carolina; safe delivery guaranteed if shipped by express. Parcels post shipments at buyer's risk. We invite correspondence as to details and price.
The Deroy Taylor Co., Newark, N. Y.

FOR SALE—Due to my time being taken up with professional work this spring, I have more bees than I can take care of properly. If in the market for good colonies of bees, please address, J. F. Coyle, Penfield, Ill.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
Superior Honey Co., Ogden, Utah.

FOR SALE—Photos of L. L. Langstroth, inventor of movable-frame hives, size 7x9; price, $1. American Bee Journal,
Hamilton, Ill.

SPECIAL SALE—1-story 8-frame dovetailed hives in flat, with telescope ⅞ wood covers, in packages of 5, at $10 per package.
A. G. Woodman Co., Grand Rapids, Mich.

SITUATIONS

WANTED—Man with some experience to work with bees coming season; state age, experience and wages; we furnish board. The Rocky Mountain Bee Co., Billings, Mont., Box 1319.

WANTED—One experienced man, and students or helpers in our large bee business; good chance to learn. Modern equipment and outfit, including auto truck; located near Summer resorts. Write, giving age, height, weight, experience, reference and wages wanted.
W. A. Latshaw Co., Clarion, Mich.

WANTED—Position as manager of farm; over 15 years' experience; also capable beeman, practical carpenter and mechanic; 5 in family. Only year-around proposition considered. Theodore Fluegge,
33 N. Elgin Ave., Forest Park, Ill.

WANTED—Strong young man of good habits to work in apiary, garden, etc., in small village. Give experience with bees, wages wanted, references, etc.
W. D. Wright, Altamont, N. Y.

WANTED—Work for season with experienced beeman, by woman studying bee culture. Must be within reach of Denver car lines; will work all or part time.
Mrs. Josephine L. Ferguson,
1043 Clarkson St., Denver, Colo.,
Phone "York 9403."

HONEY AND BEESWAX

FOR SALE — Buckwheat honey in 120-lb. cases, at 17c per pound. C. B. Howard,
Geneva, N. Y.

WE WANT every subscriber of the American Bee Journal to become a subscriber of the Domestic Beekeeper. Listen: A $5(or more) order of beekeepers' supplies at catalog price bought through the Domestic Beekeeper, Northstar, Mich., and a dollar extra for a year's subscription to the Domestic Beekeeper, will entitle you to a dollar rebate, leaving your subscription to the Domestic Beekeeper absolutely free. Could one ask more? This offer will give one an idea of what the Domestic Beekeeper is doing for its subscribers in the way of buying their supplies.

FOR SALE—Clover, heartsease, No. 1 white comb, $6 per case; fancy, $6.50; extra fancy, $7; 24 Danz. sections to case; extracted, 120-lb. cases, 25c per pound.
W. A. Latshaw Co., Carlisle, Ind.

FOR SALE—Michigan's best extracted honey in packages to suit. White clover, raspberry, milkweed, buckwheat.
A. G. Woodman, Grand Rapids, Mich.

WANTED—Comb, extracted honey and beeswax. R. A. Burnett & Co.,
6A12t 173 S. Water St. Chicago, Ill.

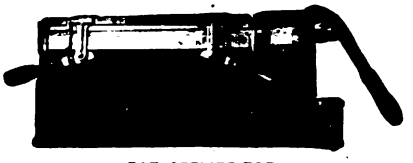
WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co.,
204 Walnut St., Cincinnati, Ohio.

WANTED—Extracted honey, all kinds and grades, for export purposes. Any quantity. Please send samples and quotations.
M. Betancourt, 59 Pearl St., New York City.

MISCELLANEOUS

E. D. TOWNSEND, the present owner of the Domestic Beekeeper, bought beekeepers' supplies for the National Beekeepers' Association for several years. He is now buying for the subscribers of the Domestic Beekeeper at the same low manufacturers' price. Listen now what he has got up his sleeve: Any American Bee Journal subscriber buying $5 worth of supplies through the Domestic Beekeeper at catalog price, and sending along an extra dollar to pay for a year's subscription to the Domestic Beekeeper, will get in return a rebate check of $1, leaving the year's subscription to the Domestic Beekeeper absolutely free to you. Of course, if your order for supplies is larger than $5 you will have a correspondingly larger rebate check on your order. One of our subscribers got a rebate check on his order of supplies last month, March, of $40. It was just like getting money from home to him, as he sent us the same money he would have had to pay if he had bought through the regular dealer in beekeeper supplies. More and more, close buyers of beekeepers' supplies are investigating the buying facilities of the Domestic Beekeeper. A word to the wise should be sufficient to cause you to send your next order for beekeeper supplies to the Domestic Beekeeper, Northstar, Michigan.

SONG—"The Plea of the Bee," or "The Honeybee Doing Its Bit." Sent to any address on receipt of 15 cents. The Cutting Publishing Co., 910 Merchants Bank Bldg., Indianapolis, Ind.



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Complete directions for operating are furnished with each device.

Manufactured by C. O. BRUNO
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The only Canadian bee publication. Keeps beekeepers closely in touch with Apicultural conditions in Canada. It is the official organ of the Beekeepers' Associations for the three provinces—Ontario, Manitoba and New Brunswick.

Beekeeping and horticulture are effectively combined to make a live, attractive and practical publication.

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Send for a free sample copy.

The Horticultural Publishing Co., Ltd., Peterboro, Ontario

THE WAGNER CAPPING MELTER—No experiment, in use over 5 years, highly recommended by practical apiarists all over the country; a perfect machine; saparates honey from cappings and broken combs, while at the same time heats honey knives. Cheapest in price, cheapest to operate. Price only $7.50, fully guaranteed A. F. Wagner,
Bonita, San Diego Co., Calif.

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FOR SALE—25 pounds Dadant's extra thin comb-foundation at 75c per pound for the entire lot. F. E. Matzke, Juda, Wis.

FOR SALE—25 metal roof covers, 25 reversible bottoms, 100 deep extracting bodies without frames, all dovetailed 10-frame size Lewis ware; perfect, spotless, painted well two coats white; freight prepaid, $125.
B. W. Wells, Appleton, Wis.

FOR SALE OR EXCHANGE—I have a 2-frame extractor in good running order, old style; will sell or exchange for a Dadant uncapping can. Elmer Kommer,
R. No. 2, Woodhull, Ill.

FOR SALE—We offer the following second-hand supers, nailed and painted and in good shape:
47 8-frame Langstroth comb-honey supers, empty, at 15 cents each.
43 10-frame Langstroth comb-honey supers, some filled with sections, some empty, at 20 cents each.
Dadant & Sons, Hamilton, Ill.

WANTED—Used hives and supers, foundation mills, extractors, bees and bee equipment. State lowest cash price wanted.
W. A. Latshaw Co., Carlisle, Ind.

ALWAYS the best place to get your supplies is at the same old place of H. S. Duby & Son, St. Anne, Ill. No one can beat us on price. Free price list.

WANTED

WANTED—Second-hand extracter, 2-frame reversible Cowan No. 17 preferred.
H. G. Kull, Trenton, Mo.

WANTED—Full or part time agents to sell our Income Protection Policies. All wage-earners will be interested. Exclusive territory. Direct home office contracts. Write National Casualty Co., Detroit, Mich.

WANTED—Good second-hand 2-frame Cowan honey extractor and steam uncapping knife; state lowest cash prices.
Fred Kubicek, Box 276, Mellen, Wis.

WANTED—Your old combs, cappings or slumgum to render into beeswax by our high steam pressure wax presses.
Dadant & Sons, Hamilton, Ill.

WANTED—July, 1916, June, July and December, 1917, and January and March, 1918 numbers of the American Bee Journal; will pay 10 cents per copy. Please wrap so that the whole Journal is protected.
American Bee Journal, Hamilton, Ill.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices.
Superior Honey Co., Ogden, Utah.

WANTED—A second-hand 2-frame honey extractor and steam uncapping knife. Give full description and lowest price in first letter.
J. J. Fitzgerald, Mitchell, S. D.

Golden Italian Queens

RUSTBURG, VA., R. No. 3, March 18, 1918.

Mr. Ben G. Davis:
Dear Sir—Please find enclosed $5, for which please send me the very best Golden Queen you can for the money. If you can't ship her at once, please notify me. I ordered one from you 3 years ago last fall that was the best I ever saw. Her bees stored 320 pounds of comb honey the first year. I have several of her daughters that are fine.
Hoping to get a good one again, I am yours truly,
J. W. LAWRENCE.

PRICES OF QUEENS

	Nov. 1st to June 1st			June 1st to July 1st			July 1st to Nov. 1st		
	1	6	12	1	6	12	1	6	12
Untested	$2 00	$8 50	$15 00	$1 50	$7 50	$13 50	$1 25	$6 50	$11 50
Select Untested	2 25	9 50	18 00	1 75	9 00	16 00	1 50	7 50	13 50
Tested	3 00	16 50	30 00	2 50	12 00	22 00	2 00	10 50	18 50
Select Tested	3 50	19 50	35 00	3 00	16 50	30 00	2 75	15 00	27 00

Safe arrival, purity of mating and satisfaction guaranteed

No Nuclei or Bees by Pound

Queens for export will be carefully packed in long distance cages, but safe delivery not guaranteed.

BEN G. DAVIS : : Spring Hill, Tenn.

Service and Quality
Bee Supplies Bee Supplies

¶ Order your supplies early, so as to have everything ready for the honey flow, and save money by taking advantage of the early order cash discount. Send for our catalog — better still, send us a list of your supplies and we will be pleased to quote you.

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QUEENS QUEENS QUEENS

GOLDEN AND THREE BANDED QUEENS

The demand for our Famous Disease Resisting Honey Gathering Hustlers is greater than ever before. Send for circular and price list

BOOK YOUR ORDER NOW

M. C. BERRY & COMPANY, Hayneville, Ala.

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The first edition of this paper is now out and we are ready for subscriptions or to mail out sample copies. It covers the entire Dixieland with 32 pages of the most instructive matter pertaining to keekeeping.

THE SUBSCRIPTION IS ONE DOLLAR PER YEAR

DIXIE BEEKEEPER, Waycross, Ga.

Texas Bred Queens

As our **Bee Shipping** season is practically over by the first of June we will have some extra queens to offer at the following reduced prices. We have shipped thousands of pounds of bees and queens all over the United States and Canada again this season

Number	1	6	12	50
Untested	$1.25	$6.50	$11.50	$40.00
Select untested	1.50	7.50	13.50	48.00
Tested	2.00	10.50	18.50	
Select tested	2.75	15.00	27.00	

One-pound package of Bees $2.40, 25 or more $2.16 each, by express f. o. b. here.
Two-pound package of Bees $4.25, 25 or more $3.83 each, by express f. o. b. here.
Three-pound package of Bees $6.25 25 or more $5.62 each, by express f. o. b. here.
One frame regular Nuclei with 1 pound extra bees $4.50 each, by express f. o. b. here.
Two frame regular Nuclei with 1 pound extra bees $6.00 each, by express f. o. b. here.
One frame regular Nuclei with 2 pounds extra bees $6.00 each, by express f. o. b. here.
Two frame regular Nuclei with no extra bees $4.50 each, by express f. o. b. here.
Three frame regular Nuclei with no extra bees $6.00 each, by express f. o. b. here.
Add the price of Queen wanted when ordering bees. Circular free giving details.

NUECES COUNTY APIARIES, CALALLEN, TEXAS

Binding for Beekeepers

We do all kinds of book binding, such as magazines like the "American Bee Journal," or any other publication. Also make any style blank book, either printed or unprinted heading

Send us your order for blank books and let us bind your magazines.

Following are prices of binding magazines:

"American Bee Journal," cloth ---------- $1.50
Half leather ---------- $1.75
"Gleanings in Bee Culture," cloth ---------- $1.25
Half leather ---------- $1.50

We also do all kinds of printing, such as Letterheads, Envelopes, Statements or Billheads, Price Lists, Advertising Booklets. No order too large or too small. We print the "American Bee Journal."

LUTZ & STAHL, Keokuk, Iowa

Honey Producers' Service

By Wesley Foster

I believe that I can help any beekeeper with a problem to solve, whether supply, producing, financial or selling, if he will write me a letter or pay me a visit and explain it to me.

QUEENS

We are operating 2,500 colonies of bees this year. They are building up strong and are all ready now for the honey-flow. At present we are requeening quite a few. We expect these queens to pay for themselves twice over. One of the best queen breeders in the United States is raising our queens for us from selected stock. If you need some good, warranted queens, unless you order now it will be too late.

SUPPLIES

We are carrying a complete line of Supplies and honey containers. You can save some money on every order by buying of us.

BEESWAX

We need some more beeswax. Have you any to spare? We can always use it at the highest market price.

A NEW CAN

I would like to tell you about a new 5-gallon can for honey that I now have. It is by far the best can that I have ever seen—practically one piece. The edges are rolled and are soldered by a special process inside and out. It has a 3-inch cap, which, as you know, makes it easy to fill. We are exclusive agents for this can in the Rocky Mountain region. It costs only a cent more than the old type.

Be sure to drop me a line at once in care of

THE FOSTER HONEY & MERC. CO.
Boulder, Colorado.

BEE SUPPLIES

Let Us Figure With You

Get our discounts before buying Largest stock in South West.

C. C. CLEMONS BEE SUPPLY COMPANY
142 Grand Ave., Kansas City, Mo.

PATENTED
Wright's Frame-Wiring Device
Most rapid in use. Save cost of machine in one day. Tighter wires, no kinks, no sore hands.

G. B. LEWIS CO. Watertown Wis.

Crop and Market Report

Compiled by M. G. Dadant

CONDITION OF BEES

Bees throughout the country seem to be in at least as good shape as last spring, but in many instances they have run short of stores. The mild winter has been responsible for using up a larger amount of stores and the bees have also bred up faster in spring, so they are stronger. Where not liberally supplied with honey, bees in many places are in a starving condition, and it will take considerable feed to carry them through until the first flow comes. This should be done, however, or brood-rearing will cease, and the bees will dwindle by the time the honey-flow begins.

HONEY CROP AND PLANT PROSPECTS

Throughout the whole of the East, and portions of the Central West, conditions are at least up to last year, and in many sections very much better. Illinois has very poor prospects, especially in the southern half, as does southern Indiana and some sections of Iowa and Missouri. Otherwise, conditions are very favorable for a good flow. In the West, it is too soon yet to make any guess, and in California prospects hardly seem to be up to normal. In Texas the conditions are very much better and the beekeepers there are looking for a good crop and a return to normal conditions, after many unfavorable years.

In the Southeast, conditions are about as good as last year, possibly a little better.

HONEY CONTRACTS

There seem to be no honey buyers in the field as yet, as all markets seem to be well supplied with honey from last year's crop. One association is announcing to its members that they expect to be able to handle the crop at the price of 15 cents for amber extracted honey and a price of about 20 cents for bulk comb honey.

STIMULATING HOME MARKET

In nearly all cases reporters stated that they were going to do their best to stimulate the home market and try to sell as much honey locally as possible. This will, no doubt, have a great deal of effect upon the prices in the larger centers if strictly adhered to by a majority of the beekeepers. In larger honey-producing sections where the population is not so scattered, there will be very little in the line of local sales. But in all of the East and Central West this action should dispose of a large amount of honey which would thus be kept out of the larger markets.

WHAT WILL THE HONEY PRICE BE?

No association, except the one previously referred to, has given any intimation as to the price they will give for honey this year, although all members of associations seem to be very optimistic and feel that their association will sell for the highest figure possible.

There are many individual reports coming in that the beekeepers expect to realize a price of at least 15 cents per pound for extracted honey and in many cases the reporters state that they will not take less than 18 cents.

From the tone of reports, beekeepers are going to insist that they get a good price for their honey, and if they co-operate properly and do not throw large quantities of honey upon the market regardless of price, it is possible that the price can be maintained at a fairly high level.

With sugar selling at retail for from 11 to 13 cents per pound, there is no reason why honey should drop very much. Other food commodities have dropped very little and in many instances they have advanced. This is in direct opposition to the earlier statements that food prices were bound to drop right along.

The large honey markets still seem to be very well supplied with old crop honey, but in all instances it is commanding a fairly high figure, very few sales being reported at less than 15 cents, many of them from 16 to 19 cents.

The report from the Bureau of Markets shows that there has been considerable honey shipped to foreign markets during the month of April and the shipments go to practictlly all of the European countries, instead of only to the British Isles, as earlier in the year. New arrivals in the New York markets are mostly from the West Indies and are commanding a price of from 12½ to 15 cents per pound. When we figure that much of this honey is of a rather low grade, it does not seem to the writer that we should be much in fear of local honey going very slow.

It is, however, a peculiar condition just at present, and very likely the beekeepers themselves will have more to do with the honey prices during the coming year than ever before. A glutting of the market is bound to reduce the price, whereas a careful study of market conditions by each beekeeper or association and a careful selling of the produce should have the desired effect.

Two or three reports have come in indicating that there is a fear on the part of some that honey will sell as low as 10 cents per pound. Other prices do not warrant such a low price for honey, but such might be possible if the attitude of beekeepers was to sell at any figure.

Why Not Save Some Money on Your Reading Matter?

Every reader of the old American Bee Journal is familiar with the three great publications of the Curtis Publishing Co., I am sure. Here they are:

Ladies' Home Journal (monthly)	**$1.75**
Saturday Evening Post (weekly	**$2.00**
Country Gentleman (weekly Farm Paper)	**$1.00**
All three, one year, for	**$4.75**
Add American Bee Journal for one year	**$1.00**
	$5.75
But I will send you all 4 of the above for an even	**$5.00**

Send me a list of what magazines you want and I will quote you a price that will save you some money. I would be glad to hear from my old friends of the American Bee Journal, and any new ones, too. I will appreciate your patronage. Address

GEORGE W. YORK, Sandpoint, Idaho

QUEENS

Quirin's Improved Superior Italian Bees and Queens. They are Northern Bred and Hardy. 25 years a years a Queen-breeder

PRICES	Before July 1st			After July 1st		
	1	6	12	1	6	12
Select unte'ed	$1.50	$ 8.00	$14.00	$1.00	$ 5.50	$10
Tested	2.00	10.00	18.00	1.50	8.00	14
Select tested	2.50	14.00	25.00	2.00	10.00	18

BREEDERS—The cream from our entire stock of outyards, $5 each, usually we can send all queens promptly after June 10th.

Breeders, select tested and tested queens can be sent out as early as weather will permit.

Send for testimonials. Orders booked now.

Reference—any large supply dealer or any bank having Dun's reference book.

H. G. QUIRIN, Bellevue, O.

TENNESSEE-BRED QUEENS

Forty-Seven Years' Experience in Queen-Rearing

Breed Three-Band Italians Only

	Nov. 1 to June 1			June 1 to July 1			July 1 to Nov. 1		
	1	6	12	1	6	12	1	6	12
Untested	$2.00	$ 8.50	$15.00	$1.50	$ 7.50	$13.50	$1.25	$ 6.50	$11.50
Select Untested	2.25	9.50	18.00	1.75	9.00	16.00	1.50	7.50	13.50
Tested	3.00	16.50	30.00	2.50	13.00	23.00	2.00	10.50	18.50
Select Tested	3.50	19.50	35.00	3.00	16.50	30.00	2.75	15.00	27.00

Capacity of yard, 5,000 queens a year.
Select queen, tested for breeding, $5.
The very best queen, tested for breeding, $10.

Queens for export will be carefully packed in long distance cages, but safe arrival is not guaranteed. I sell no nuclei, or bees by the pound.

JOHN M. DAVIS, Spring Hill, Tenn.

EXPERIENCE COUNTS

An experienced beekeeper in Iowa writes:

"I must say it is a pleasure to use Lewis Beeware. Have used some that was cheaper, but the difference in quality vastly more than compensates for the difference in price."

A word to the wise—USE LEWIS BEEWARE. Write today. Dept. B

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SIOUX CITY, IOWA

BEE SUPPLIES

We carry a complete stock of supplies at all times, and can make prompt shipments Our prices will interest you.

A trial order will convince you that our prices and goods are right.

Send Us Your Inquiries

A. H. RUSCH & SON CO.
REEDSVILLE, WIS.

BEES

We furnish full colonies of Italian bees in double-walled hives, single-walled hives and shipping boxes. Three-frame nucleus colonies and bees by the pound. Tested Italian queens, $2; untested, $1.50. Price list free

I. J. STRINGHAM, Glen Cove, N. Y.
NASSAU, CO.

Write for Price List and Booklet descriptive of

HIGH-GRADE Italian Queens

JAY SMITH
Route 3
Vincennes, Ind.

Archdekin's Fine Italian Queens and Pound Packages

Untested queens, 75c each, 6 for $4.25; doz., $8. Select tested, $1.25. Safe arrival of queens guaranteed.

Package bees, without queens, $1.75 per lb Packages, with queen, 1 lb. and queen, $3.50; 2-lb. and queen, $5.75; 3-lb. and queen, $4.75.

My package is best and lightest in use. Saves bees and express. In case of loss in transit, I will replace loss or recover from express company upon proper presentation of loss by customer. I fully protect my customers from loss.

J. F. ARCHDEKIN,
Big Bend, La.

Golden Queens

After April 1, untested $1.25 each, 6 for $7, or $13 per doz. or 50 for $48. Also untested 3-band at same price; tested, $3 each, and my very best $5 each. Satisfaction.

R. O. COX
Route 4, Greenville, Alabama

Don't stop advertising.

because honey is high. Make it more in demand, so the price will stay where it is. Little stickers on your letters, papers, etc., will help. Printed as below in bright red.

EAT HONEY
NATURE'S OWN SWEET AIDS DIGESTION

Price of 1,000 gummed, 85c.
American Bee Journal Hamilton, Illinois

WESTERN BEEKEEPERS!

We handle the finest line of bee supplies. Send for our 68-page catalog. Our prices will interest you.

The Colorado Honey-Producers' Association
1424 Market Street, Denver, Colo.

Established 1885

We are still furnishing beehives made of white pine; they will last. A. I. Root Co.'s make of bee supplies kept in stock. Send for catalog giving full particulars; free for the asking. Beeswax in exchange for supplies, or cash.

JOHN NEBEL & SON SUPPLY CO.
High Hill, Montg. Co., Mo.

AMERICAN BEE JOURNAL

VOL. LIX—NO. 7 HAMILTON, ILL., JULY, 1919 MONTHLY, $1.00 A YEAR

SOME OBSERVATIONS ON NOSEMA-DISEASE

By G. F. White, Bureau of Entomology, Washington, D. C.

NOSEMA-DISEASE, in many ways, is one of the most interesting of the diseases of adult bees. Doubtless the beekeeper already is quite familiar in a general way with the nature of the disorder since the bee journals have carefully presented the facts concerning the disease as they have been determined. Since 1910 the writer has been making some studies on the disease, and in the present communication there are discussed briefly some of the more important observations obtained which would seem to be of interest to all beekeepers. In a bulletin* (No. 780) recently issued by the United States Department of Agriculture, the writer has given in some detail the results obtained which have a more or less direct connection with the problems with which the practical apiarist is confronted. No direct work on the treatment of the disease was undertaken. In planning the investigations, however, the problems selected were of such a nature that the results obtained from them could be used by the beekeepers in devising methods for treatment.

Nosema-disease Not a New Disorder

The disorder now known as Nosema-disease was reported by an European observer as early as 1857. That such a disease of bees exists was afterward almost forgotten until the fact was again brought to the attention of beekeepers in 1909. The disease is present at least in Australia, Switzerland, Germany, Denmark, England, Canada and the United States, and has been reported from Brazil, also. Most likely it has a much wider distribution, even, than this. The writer found Nosema infection in bees received from 27 different States in the United States.* These were from the North, the South, the East and the West. The disease is, therefore, very widely distributed in America and is not a new one to cause losses to apiaries. The information regarding the disease is of recent origin, but not the disease itself. It is better to think of the disorder as one which has been collecting toll from apiaries longer than bees have been kept in America, and probably longer than bees have been kept anywhere by man.

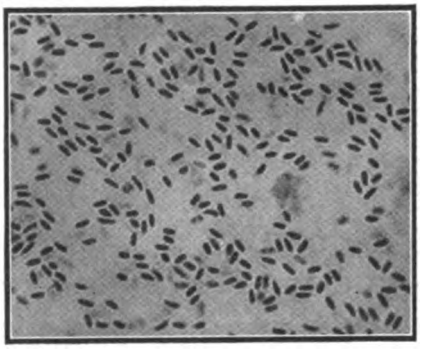


Fig. 1.—Photomicrograph of *Nosema Apis*.

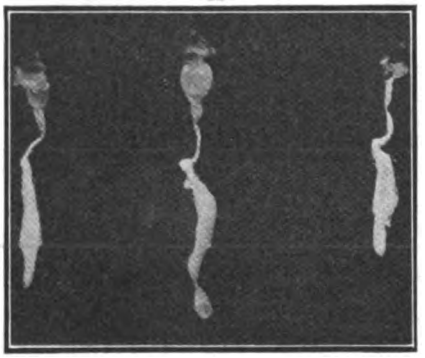


Fig. 2.—Stomachs removed from Nosema-diseased bees. Beginning at top the picture shows the tip of the abdomen, large intestine and small intestine. The proventriculus and honey sac are to be seen with the middle one of the three.

Germ Causing Nosema-disease

The germ that causes Nosema-disease is a protozoan, a one-celled animal parasite. **Nosema apis** is the name which has been given to it. The parasite has a growing (vegetation) form and a spore (resting) form. To the apiarist the spore form is the more important. The spores are small oval bodies (fig 1) which, if placed end to end would require 5,000 to measure an inch, and if placed side by side would require 10,000 to measure this distance. These spores are taken into the stomach (fig. 2) by the adult bee, with the food or water. The digestive juices acting on the covering of the spore release the young parasite. These young forms immediately find their way to the wall (fig. 3) of the stomach and invade it. Once within the wall of the organ they grow rapidly and multiply to an enormous extent (figs. 3, 4, 5 and 6). Spores are then produced in large numbers and are shed into the stomach and, being mixed with the partially digested food (fig. 3), are carried through the remainder of the intestinal tract, to be voided with the excrement. Should such excrement reach the food or water supply of bees it will be seen how other bees might thus become diseased..

Name of the Disease

Since Nosema-disease has affected apiaries as much in the past as at present, it is of interest to know the name used, by beekeepers, for the condition to which the losses due to it are attributed. Early during the writer's studies, it was observed that the highest percentage of Nosema-infected bees were present in weak

* Bulletin No. 780 was written primarily for beekeepers. Strictly technical discussions were purposely avoided in preparing it. While it contains some semi-technical terms, it is believed these will offer no particular obstacle to a satisfactory understanding of the subject matter presented.

* Bulletin No. 92, U. S. Department of Agriculture, May 15, 1914.

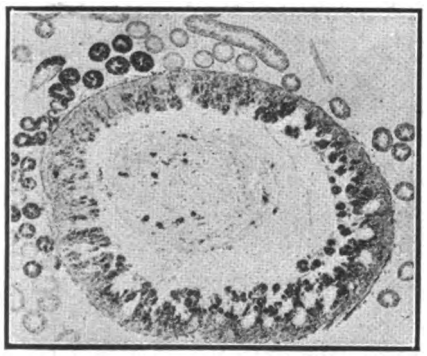


Fig. 3.—A magnified cross-section of a stomach shown in Fig. 2. The germs are stained black. Note that some of the germs have been shed into the stomach and are mixed with its contents.

colonies. This fact led to the request made of beekeepers, in different sections of the country for adult bees from weak colonies. Out of about 150 samples received in reply, fully one-half of them contained Nosema-infected bees. Nine well-informed beekeepers, among those sending samples, were asked concerning the name by which the disease condition was known to them. Of these 3 replied "spring dwindling", 2 "not spring dwindling", 2 said "weak colonies," and 1 wrote, "I don't know."

Bees from spring dwindling colonies were requested also from beekeepers. Out of 38 samples received, only 15 contained Nosema-infected bees. In reply to requests for bees from hives in which colonies had died during the winter, 19 samples were received and 7 of them contained Nosema-infected bees. Out of 5 samples taken from colonies which beekeepers had diagnosed as suffering from paralysis, no bees were found infected.

From these facts it will be observed that no one name was being used, by American beekeepers, for the condition to which the losses due to Nosema-disease were attributed. Some, it will be seen, referred to the condition as spring dwindling, but others did not. That the disease contributes in part to winter losses is quite evident. It is an interesting fact that neither paralysis nor dysentery was suggested, by beekeepers, for the condition in colonies in which Nosema-infected bees were present in large numbers.

When Zander reported his observations, in 1909, he used the name "infectious dysentery." This name was misleading, and fortunately he soon afterward introduced another one, which is more appropriate. As the common name for the disease, in English, the writer has suggested the term "Nosema-disease." This is simply a translation of the more appropriate name given to it by Zander.

That the following names have been used, in one or more countries and from time to time, for the disorder that is produced by **Nosema apis,** is very probable: Dysentery, paralysis, palsy, spring dwindling, dropsy, disappearing trick and Isle of Wight disease. To this list the beekeeper, most likely, could add many more. It is not at all probable, however, that any one of these had been used exclusively for the disorder now known as Nosema-disease. Whether the diseases of adult bees are few or many is not definitely known, but it seems probable that they are fewer than are the names which have been used for them. Practical beekeepers have made some interesting observations, on the adult bee diseases, but it must be admitted that very little of a definite character has yet been obtained, from an experimental and laboratory study of these diseases, excepting Nosema-disease.

A word should be said in regard to Isle of Wight disease, in order to allay any possible uneasiness which might be felt in America regarding it. The writer has not encountered, during his studies, any condition which causes the losses which have been attributed to Isle of Wight disease in England. Certainly Nosema-disease does not cause such losses in America. Since the Isle of Wight disease does not seem to be in America, fear by American beekeepers is scarcely justifiable at the present time. Students of the disease in Great Britain no doubt will supply, in due time, as a result of their investigations, the information on the disease which is wanting.

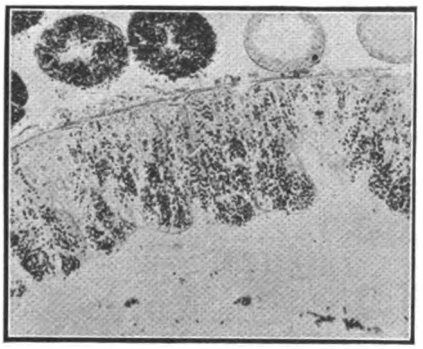


Fig. 4.—A portion of Fig. 3 more highly magnified.

Beekeepers will recall the technical name, "Microsporidiosis," which has been used for the disease caused by **Nosema apis.** This name was chosen because **Nosema apis** belongs to a group of protozoa "Microsporidia." While the name is appropriate, some criticism has been offered by beekeepers, because of its length and because it is not readily understood. By way of explanation of the term, it might be said that the term "nosemosis" could have been coined and used as the technical name in much the same way. The origin of the latter term will be readily recognized.

The Experimental Apiary

Much concerning the nature of Nosema-disease has been learned by observing it in the experimental apiary. The space occupied by the apiary (fig. 7) was broken up by small trees. In arranging the hives, uniformity as to their relation to each other was intentionally avoided. A nucleus which could be accommodated comfortably on from 4 to 6 brood-frames was found to serve well the purposes of an experimental colony. The entrance to the hive (fig. 8) was closed except a small space on the side occupied by the frames with wire cloth. Shallow dishes placed on the bottom-board on the side occupied by the brood-frames were used as feeders.

At the beginning of the experiments all of the colonies of the apiary were free, or practically free, from Nosema infection. In making the inoculations the experimental colonies were fed about one half pint of sugar syrup, to which had been added the crushed stomach of Nosema-diseased bees. These colonies were left in the apiary and were not confined, but were allowed to enjoy the same freedom after the inoculation as before.

How to Examine Bees for Nosema-disease

Upon examining a large number of young bees it was observed that among them there were practically no Nosema-diseased ones. The same was found to be true of the very old bees. In making the examination, therefore, for Nosema-disease in colonies, bees that were neither very young nor very old were selected. As drones are not likely to be found infected, except in experimental colonies recently inoculated, they were not chosen in making the examinations. As the brood does not become infected, it cannot be used.

The younger bees may be avoided by selecting field bees and the very oldest ones may be omitted from the samples taken by avoiding those that are shiny. It was found that for most purposes 10 bees make a very satisfactory sample for examination. The bees are taken at the entrance of the hive. Those carrying pollen, if pollen is being brought in, are the ones chosen, as they are readily recognized as field bees. As an individual bee, sick of Nosema-disease, presents no outward evidence of disease, and since only by the changed appearance of the stomach can the disease be diagnosed, the bee must be sacrificed in making the diagnosis. They are caught by the thorax with forceps and by slight pressure are easily killed.

In removing the stomach, the thorax is held between the thumb and index finger of one hand, and with fine-pointed forceps (preferably curved) in the other, the tip of the abdomen

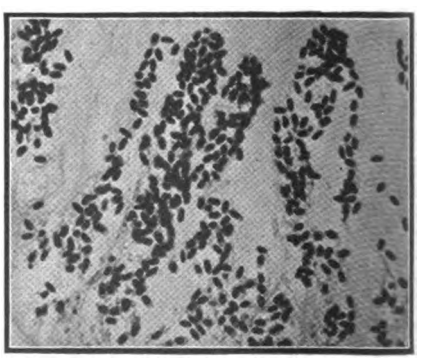


Fig. 5—Shows a still higher magnification than Fig. 4.

is seized. By gentle traction the digestive tract forward to and including the stomach, and occasionally also, the proventriculus and honey sac, may be removed (fig. 2). The largest and usually the last portion to come away by this method is the stomach (ventriculus). This is a relatively thick-walled, elongated and more or less spindle-shaped organ.

The color and size of healthy stomachs are variable. They vary somewhat with the age of the bee and also with the season of the year. The color of the stomach of workers ranges from a light yellowish brown to a deep red, corresponding to the flesh of the ox. Sometimes the appearance of the organ is due, in part, to the presence of pollen in it. The stomach of the drone is smaller and lighter in color than that of the worker. The stomach of the queen is also smaller than that of the worker, but less difference exists, in her case, than in the case of the drone.

The diseased stomach is lighter in color than the healthy one. Late in the course of the disease it is white. The diseased organ not infrequently tears by the traction which is necessary to its removal and is more easily crushed than the healthy one, and when crushed the mass is milky in appearance.

Nosema-disease Weakens Colonies

Since the stomach of a bee (figs. 2, 3, 4, 5 and 6) is very abnormal in Nosema-disease, it is only natural to expect that an affected bee is less efficient as a member of the colony than a healthy one. The results obtained from experiments support this position. It was found that the strength of experimental colonies diminished as a result of Nosema infection, when no brood, or very little of it, was being reared. Furthermore, it was found that by inoculating a colony every 3 or 4 weeks during the more active brood-rearing season, the strength of the colony remains more or less uniform, while colonies in the same apiary which have not been inoculated make the customary gain.

Ten colonies, each of which were easily accommodated on from 6 to 7 brood-frames, were inoculated about the middle of September, 1912. These weakened as a result of the infection that was produced. By the middle of May of the following spring, 5 of them were dead. The 5 that lived through the winter, though weak in the spring, recovered from the infection, gained in strength during the brood season, and by autumn were as strong as the average for the apiary. Colonies inoculated at the beginning of the active brood-rearing season first lose, but later gain in strength, due to the young bees that are produced. Such colonies, however, are not as strong relatively as the uninoculated ones. It is seen, therefore, that Nosema-disease does tend to weaken colonies.

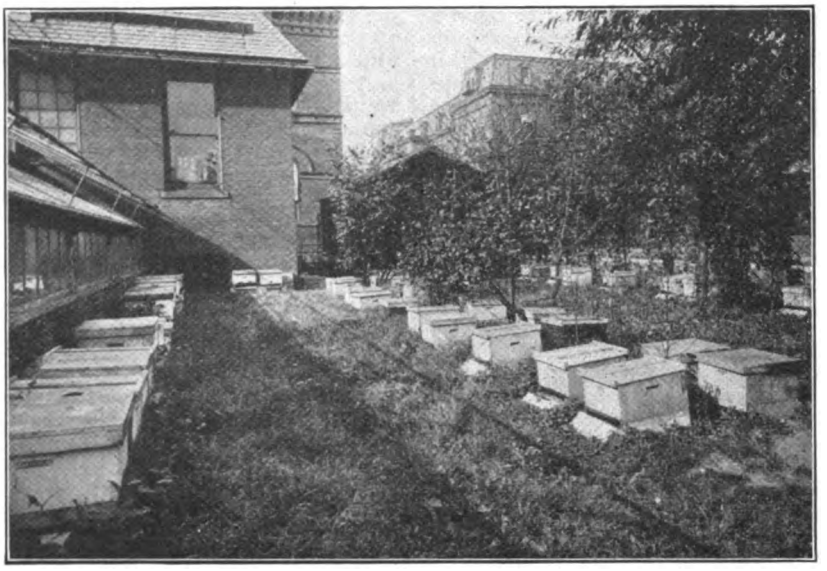


Fig. 7.—Apiary in which the 1915 experiments were conducted.

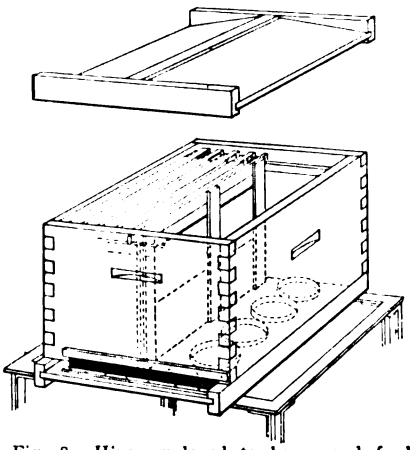


Fig. 8.—Hive employed to house and feed an experimental colony.

Nosema-disease Sometimes Kills Colonies

From what has just been said it might be expected that Nosema-disease, under certain circumstances, may kill colonies. Those which were inoculated in the fall of the year, after the brood-rearing season was over, invariably died somewhat later during the winter.

Not only was the disease studied in colonies in which it had been produced by experimental inoculation, but also in an apiary in which it was contracted through natural means. Such an apiary, located near Washington, D. C., furnished a favorable opportunity for a 3-year observation of the disorder as it occurs in nature. The April count of the apiary in 1912 was 24 colonies.

Of these, 5 died during the bee season and were dead by the end of May. The percentage of Nosema-infected bees, among the field bees of these colonies, ranged from 50 to 100 per cent. Results similar to these were obtained during the remaining two and one-half summers that the studies were being made on the apiary. The facts determined show that Nosema-disease may, and sometimes does, kill colonies.

Colonies Have a Tendency to Recover From Nosema-disease

In order to maintain Nosema infection, in an experimental colony, during the more active bee season, repeated inoculations were necessary. In about 2 weeks after an inoculation feeding, practically all field bees are diseased, but after 1 month very few infected ones are present. The diseased bees die, the young ones emerging are healthy, the infection spreads very little, if any, from the sick bees to the healthy ones, and as a result the colony is comparatively free from infection. It was seen from the experiment referred to above, that 5 out of the 10 colonies inoculated in September wintered, and by the fol-

Fig. 6.—Drawing of section of the wall of diseased stomach. The cells lining the stomach which secrete digestive juices and probably also absorb some food substances, are filled with the germs. (Proc. Ent. Soc. Wash. 1918.)

lowing fall equaled in strength the uninoculated colonies of the apiary.

During the studies made in 1912, on the disease occurring in nature, it was found that each of the 19 colonies of the apiary contained some Nosema-infected bees at one time or another. These colonies gained in strength during the summer and contained a smaller percentage of Nosema-infected bees in the fall of the year than in the spring. The percentage of colonies that died during the winter 1912-1913 was less than during the winter 1911-1912. Nosema infection was present in the apiary in 1913, 1914 and 1915, but a relatively fewer number of colonies died during the latter years than in 1912.

It is seen again that while some colonies do die of Nosema-disease, by far the greater number of infected ones do not. The colony, therefore, tends, in a general way, to recover from the disease. In other words, in the case of Nosema-disease the tendency of the colony to recover from the disorder is greater, as a rule, than is the tendency of the disease to destroy the colony.

(Continued in August Number)

The Senses of Bees

By J. E. Crane

DURING the summer of 1918, while inspecting a yard of bees, I incidentally asked the proprietor if he knew where the bees got the wax with which to build their combs. Much to my surprise, I found he had not the slightest idea as to where the wax came from. Later I put the same question to another beekeeper, who was the proud possessor of 100 colonies, and found him no wiser. So I have been wondering if our journals and writers are not taking more space in discussing hives, tools and necessary manipulations to secure the greatest profit, than in the study of the bees themselves, which are among the most interesting creatures with which we have to do. More space in proportion to its importance, I mean.

Suppose we think for a little time on the senses of bees. Have we stopped to think that bees have various senses the same as ourselves, and are guided by them the same as we are? Hearing, seeing, tasting, smelling, and the sense of touch or feeling, and perhaps others. I have placed hearing first, although there are many who still doubt whether bees can hear.

The fact that bees make several distinct sounds would indicate that they are made for a purpose. Those with some experience recognize the sharp, high key of an angry bee. "I no like it when they go zing," said a Frenchman who used to visit one of our yards. Neither do we like it, for we feel instinctively that not only the bee that makes the sound is likely to sting, but others will be attracted by the sound and sail in to drive away the intruder. How many times have we seen a swarm in the air apparently in trouble? We find the queen that has dropped to the earth and place her where the bees had begun to cluster, and, presto! what a change! There is now a joyful sound and the bees flock to the spot where the queen was placed. Almost always, if a swarm has clustered within reach, I take a pint or more of bees and place at the entrance or inside the hive, that they may first find the home they want and call the swarm when shaken in front of it.

What wonderful eyes bees have! Thousands of them covering a large part of the head, and so arranged that they can see in almost every direction at the same time. This is important, as they cannot turn their heads as birds and animals can. How desirable that they take in so large a part of the landscape at once in their search for flowers. Lacking the power to change the focus of their eyes, some of these compound eyes may be adapted to seeing long distances, and others to near-by objects. What an admirable arrangement!

While bees have a keen sense of taste they can hardly be said to be fastidious, for they gather many different kinds of honey; the mild-flavored kinds as well as those that are bitter or rank tasting. This is well, for if they were willing to gather only the choicest grades, they would starve in many places, yet when they can choose, they, as a rule, prefer the finer, mild-flavored kinds. There are well-marked differences in different colonies, some working much better on dark, ill-flavored honey than others. Black bees, as a rule, will gather much more of buckwheat honey than Italians under the same conditions. Some colonies take more readily to gathering honeydew than others, although it is within the reach of all.

The sense of smell in bees is so acute and wonderful that we can hardly comprehend it; their very existence depends upon it. It may even surpass that of a fox or blood-hound. By it bees can recognize their own queen from a stranger. The bees that stand on guard at the entrance of their hive can, by their sense of smell, tell the inmates of their hive as they return from a flight from bees from other hives. Von Butel Reepen believes that bees recognize eight different odors about their hives. But this sense is one of the most important in their search for honey or nectar.

A friend was telling me some time ago how he stored some honey in a spare room on the first floor of his house; after stopping every crack and crevice of doors and windows, he found bees getting into the room, and on watching he found the bees came down the chimney and into the room through an open fireplace. Have we stopped to inquire how the bees find the flowers that yield nectar? Of course bees can see fruit trees or a field of buckwheat or mustard and be attracted to them, but most flowers that yield nectar are comparatively inconspicuous, and something is needed to guide the bees in their flight other than their eyes. A hunter goes to the fields or woods for a day's recreation hunting bees. If he finds a bee on a flower he feeds it and sends it home to get the line; but if he finds no bees he burns a little piece of comb that the odor may drift off with the smoke and attract the bees. One hunter, unable to find a bee, used this method and after waiting a long time a bee appeared, which they were able to line some six miles to its home. A bee leaves its hive in search of honey, flying in ever widening circles until it comes across the odor of some nectar-yielding flower, when it follows it as a fox-hound follows the trail of a fox that has passed, it may be, several hours before. Nothing seems to escape them in their search, whether it be an isolated burdock back of the barn, a little patch of mignonette in the flower garden, or a few stray clover blossoms in the lawn.

How about the drones? They do not gather nectar nor guard the hive, and yet we are told this sense is more highly developed in them than in worker bees. The only excuse for drones is said to be the perpetuation

Experimental apiary and garden of W. J. Sheppard, Nelson, British Columbia
Toledo, Ohio

of the species, and this depends on their ability to meet the queen in flight. Now, if the queen leaves a trail of odor in her flight through the air, as I believe she does, this keen sense of smell will multiply many times the chance of a drone meeting her. J. Henri Fabre tells of hatching some female moths or butterflies in cages in his house when, soon after, his house was literally surrounded by males. He could only account for it by the keen sense of smell in the males.

The sense of touch is very highly developed in bees. I have sometimes been asked whether bees could work in the dark, the questioner little thinking it is always dark inside a hive. It appears to be largely by this sense the bees are able to find their way around inside a hive crowded with bees. In our childhood we called the antennae of bees their "feelers," and so they are, most emphatically, but their sense of touch is not confined to these organs; their tongues and mouth parts are also very sensitive. This enables them to watch the hatching brood and feed it as its age requires. Not only is the keen sense of touch required in the rearing of brood, but in working and moulding their wax into the most exquisite combs, with cell-walls so thin that hundreds of the sides can be laid on top of each other before they will make an inch in thickness. Yet I have never seen one made with a hole through it. The touch of human fingers cannot be compared in delicacy to that of bees.

Many other things might be said in regard to the senses of bees, but if I have said enough to excite the reader's curiosity and lead to study the bees themselves, they will find a never-ending source of recreation and pleasure.

Middlebury, Vt.

Examination of Colonies

The Secretary of our local bee association asserts that last year he examined 300 colonies in three days. Last year he had 600 colonies and says that by this year's working time he will have 800.

What I would like to know of you is, how many colonies, examined, do you call a fair day's work? I have never yet examined otherwise than by removing each frame from the hive-body, looking at both sides, etc.' and, of course, no one could thus do as many as stated.

Probably you examine by just lifting up the rear of a hive—but what about same slipping forward? What about doing this with your heavy hives?

Then what do you see? Are there not often queen-cells in center of frame, thus invisible from below? Then, if there are cups along lower rim of frame, one often could not see whether they contain eggs or not. Dr. Miller has stated that unless cups contain eggs they are insignificant as to impending swarming.

What I would like to know is as to the minutia of colony examination that can be gone through with, quicker than my way as above stated, and then, to what extent such examination can be made to cover the maximum of ground. For instance, one thing seems sure, that 800 colony beeman, by his way of lifting up the rear, can't ascertain anything about queenlessness.

ULSTER, PA.

Answer.—This is a moot question, very much debatable. First, the apiarist may be slow or quick in action, and that would affect the result. One day two men came to paint the cupola of my barn. While one was looking at it and lighting his pipe, probably deliberating how to go at it, the other one had grabbed a ladder, climbed to the roof, crawled to the comb of it, and handed down the end of a rope which was wound around his waist, before the other man's pipe was fully lit. He called for scaffolding and nails and hammer. The first man was probably **methodical,** but this one was **practical.**

I believe 300 colonies may be summarily examined in 3 days, besides making the trip to each apiary. Each hive may be opened, and a glance given to the top of the combs, to ascertain whether they have honey and brood. The queenless ones may be marked, those short of stores may be helped from the surplus of others or supplied from combs at hand. But no thorough examination may be made in that length of time, even by the man who climbed the roof of my barn while his partner lighted his pipe.

No, we do not lift the rear of a hive to ascertain whether they have what they need. But after making sure that they are all right, we might lift a very heavy-looking colony and a very light-looking one to establish a comparison.

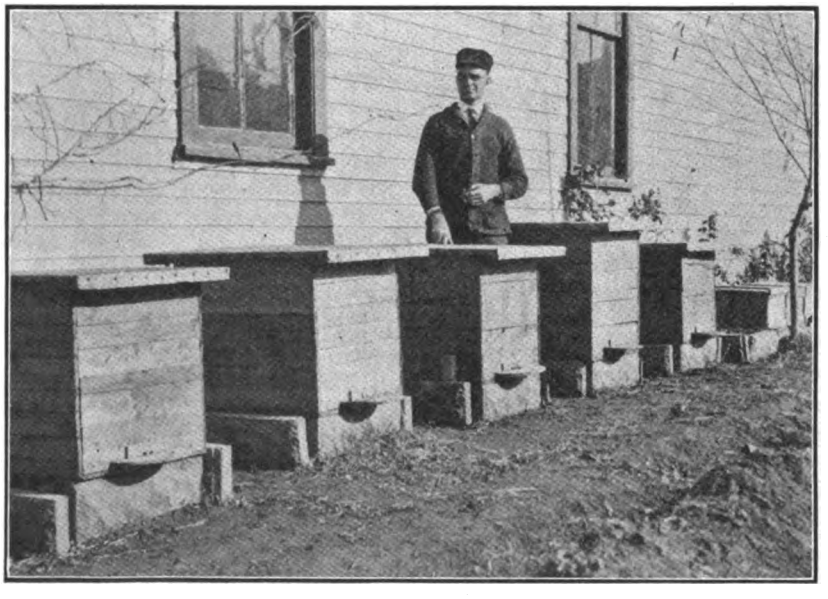
If you must look for queen-cells, then do not figure on attending properly to more than 50 or 60 colonies. Personally, we do not look for queen-cells. We expect our bees to get along with very little cell building, if we keep young queens in the hives. Dr. Miller is correct, we think, when he says that cell-cups that do not contain eggs are of no importance.

Queenlessness should be readily ascertained from the outside, as you pass along the row. A queenright colony is busy flying back and forth. A queenless colony is listless and indifferent in action. But we should at least open every hive, and the first sight of the inside, without lifting more than one or two frames, should enlighten us.

Finding out the condition of the colonies is less than half the work, if we have either queenless or starving colonies. The labor consists in remedying the faults; feeding the colonies that are short; uniting or requeening the colonies that are queenless. If our colonies are all strong and all have plenty of stores, the work will be short and the result satisfactory. But this would be an ideal situation. Do we often find it?

The amount of time required to examine 300 colonies, in 3 apiaries, depends on the condition of the bees in those apiaries and upon the season of the year at which we make the examination. It depends also upon just what we want to do. A very practical beekeeper could probably examine 100 colonies during the day and, marking them as he goes, place them in 3 or 4 classes: 1, the good ones, having plenty of brood and honey; 2, the middling ones, having both brood and honey, but of doubtful amount; 3, the poor ones, with some brood and short of stores; 4, the bad ones, queenless or starving. In making this examination he would not be expected to lift the combs of any but the dubious ones. In some cases, he might have to lift all the combs of a colony. But in all this he could do but little to remedy defects, unless he took more time.

If the bees are in good shape, a man can put on the supers—if they are ready—in less time than it requires to examine the bees. So. much depends upon the condition of the colonies.—C. P. D.



West Virginia bees packed for winter. L. O. Simmons' apiary at Martinton.

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language. Consolidated with The National Bee Journal in 1874.

Published monthly at Hamilton, Illinois.

Entered as second-class matter at the postoffice at Hamilton, Illinois.

SUBSCRIPTION RATES—In the United States and Mexico, $1 per year; three years, $2.50; five years, $4. Canadian postage 15 cents, and other foreign countries 25 cents extra, per year.

All subscriptions are stopped at expiration. Date of expiration is printed on wrapper label.

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THE EDITOR'S VIEWPOINT

Exporting Our Product

The American Shipping Board, under date of May 17, published a letter from the Director of Division of Operations showing that there is no reason why America should not be one of the most successful shipping countries and advancing the very powerful and rational argument that, since we carry cargo on the Great Lakes at the lowest cost per ton known in the world's commerce, we should also be able to carry goods to foreign countries at as low a rate as any other nation.

This is sound argument. We need to produce and export our surplus, whether wheat or honey, and we need to import many articles which cannot be produced at home. Let us urge the aggrandizement of our merchant marine.

Diseases of the Adult Bee

The leading article of this number is the beginning of the study of Nosema, by Dr. White. Most of our readers know that Dr. White was the first scientist to positively differentiate between the two main diseases of brood. His studies, completed by Dr. Phillips in additional descriptions, easily place him at the head of students in brood diseases, we believe.

The study of diseases of the adult bee is in its infancy. But scientists, on both sides of the Atlantic, are making investigations. The April number of the "Scottish Journal of Agriculture" contains a 14-page article relating the experiments in Isle of Wight Disease made by Messrs. John Rennie and Elsie J. Harvey. The experiments related are valuable, but we are far from definite and positive knowledge concerning the causes and remedies of the different diseases of adult bees.

Those of our readers who are interested in these studies will do well to preserve this number of the Journal until the entire study of Dr. White is published, which will be in the next one or two issues. Sooner or later, with the help of these careful students, the causes and cure of the different adult bee diseases will be found.

The same number of the above-named publication also contains an interesting article on Scottish beekeeping by our friend and correspondent, John Anderson, M. A. Copies of this magazine may be obtained by sending 8½ pence to H. M. Stationery Office, 23 Forth St., Edinburgh.

Another Boost of Freight Rates on Honey

Just now there is up before the Interstate Commerce Commission a proposition to raise the classification on honey. A hearing was held on the proposal to raise the rate on extracted honey, in barrels, from fourth to third class in the southern classification. Our associate editor, together with a representative of the Root Company and one of the G. B. Lewis Company, was present at this hearing in an effort to make a showing for the beekeepers.

It is a difficult matter to keep down freight rates as long as beekeepers insist on shipping honey to market in packages which will not carry safely. Barrels with less than eight hoops should never be used for shipping honey, and only good hardwood barrels or new barrels of other kinds should be used. Saving a few cents in the cost of a shipping container at the expense of higher freight rates is poor economy. Too many beekeepers refuse to take sufficient precaution in preparing their honey for shipment, thinking that the railroad company will have to pay for any loss. In the end the shipper always pays the loss with a margin beside. The average of losses are charged up in the form of higher rates and the careful shipper is penalized for the damage done by the careless one.

The use of cheap cases should be discouraged. Veneer cases for 60-pound cans should not be offered for sale at any price. The safe case is cheapest, in the end, every time. The breaking of a case of honey in a freight car is an expensive thing Honey smeared over other goods is likely to cause a big loss aside from the honey itself, but it is all charged to the honey, and when the rates will not pay it, up go the rates. There is no better service that beekeeping organizations can do than to look after this matter of proper containers for shipping honey. We all help to pay the bill for the other fellow's carelessness.

The Colony Morale

Having traveled, only a few weeks before, among the steep hills and along the deep lakes of New York State, in my trip to Cornell University, I found it quite a contrast to travel from Chicago to Lafayette, Ind., on the almost lake-level route of the Monon. I was under the impression that the builders of this railroad had named it thus originally because they considered it "the only one" worthy of the name of railroad (from the Greek, monos, unique). But this is only the name of a town through which the line passes, and thus I lost some imaginary poetical idea connected with prosaic railroading.

Purdue contrasts greatly with Cornell, in the scenery. Were it not for the Wabash river, which separates the university from the city of Lafayette, and a slight hill to ascend before reaching the grounds, one could not find tamer scenery. The University itself compares well with others in its extent, its buildings and the courses it furnishes to the student. A very interesting trip through the institution was given us on the fourth day, under the guidance of Dr. J. Troop. Entomologist. Universities usually neglect an opportunity of this sort to make themselves known, to strangers, in their details.

The course in beekeeping was held

in the main agricultural building. The attendance was not large, perhaps only a third of that at Cornell, not over 50. If beekeepers only knew how much they can learn at such courses, the attendance would have been ten times as large. Courses in beekeeping are a new thing, comparatively, and we, old heads in the commercial line are apt to overestimate our knowledge and make light of the theories brought forward, backed by experiments which sometimes contradict our preconceived ideas. Much that we think we know we have to "unlearn" or correct.

As I was present during only two days of the course, it will be out of the question to give a review of it all. I prefer to speak of only one point which impressed me more than any other. This was brought out by Mr. Demuth under the name of "morale."

We already know that we must rear the excess of our bees **for the crop** and not **on the crop.** But we must also be careful to encourage their morale, or their activity at the time the crop is on.

Do bees loaf, and what causes them to loaf? Although the actual loafing of bees may seem preposterous as an affirmation, there is no doubt that colonies of certain disposition or in certain circumstances show more activity than others. I positively know that colonies which have been transported from one spot to another some distance away, in spring, show more activity than others that have remained at the old stand. There appears to be something in the change of surroundings, or in the shaking-up which they have experienced, which impels them to greater activity.

That some bees do loaf at times seems quite plain when we examine a colony of bees and see the unconcerned appearance of many of them, which contrasts with the activity of many others in the same hive. Everybody knows that a queenless colony loses much of its activity; that a colony from which the honey has been extracted, during the crop, and combs returned to it still daubed with honey, will more eagerly go to work; that when a super is raised which is almost full and an empty one placed between it and the brood-chamber, the bees seem to hasten to fill the vacant space.

As Mr. Demuth put it, "if we can increase the activity of our field workers by one single trip a day we will increase our crop largely."

Empty cells near the brood urge the bees to greater activity. If we can fix our colonies so the bees cannot see the finish of their job, a hive full, we will keep them in a condition of greater activity.

Although we mentioned this possibility of greater activity years ago, yet we did not put as much stress upon it as does Mr. Demuth. He is surely right. Others have spoken of it before. The "baits" or partly built sections put into a super are inducements to greater activity. In paragraph 745 of the "Hive and Honey Bee," at the end of the chapter on "Comb-honey Production," we quoted W. Z. Hutchinson, who at page 18 of his "Production of Comb Honey," wrote: "We have seen bees sulk for days during a good honey-flow, simply because the present condition of things was not to their liking."

If I had gained but this emphasized idea concerning the required "morale" of the colonies during the crop, I should consider my trip to Purdue well paid.

Let me close this argument on morale by quoting Demuth's comparison of men and bees: "We should try to increase the activity or morale of our bees during the crop in a way similar to the increased activity of the human race, caused by the late war."

Beekeepers Should Be Organized

It is becoming more and more apparent that only through general organization can the beekeeper hope to secure such a measure of prosperity permanently as is opening for other lines of business. Labor is now thoroughly organized in all the trades, and these various organizations are federated into one body, which is very effective in securing for the laboring man the rights to which he is entitled. Big business is being organized in a similar way, and there is a federation of business men, which looks after the interests of business.

Unless the various agricultural activities shall become organized in a similar manner, there will be no means of securing the ear of the public as to the needs of agriculture. The unorganized business is the last to secure attention, and the first to suffer inconvenience in any abnormal condition. It is to be hoped that the beekeepers will see the necessity of organizing into local associations and that some plan can be worked out of federating these local associations into a general organization which will be sufficiently powerful to meet any emergency that may arise.

Beekeepers' Letter

The Michigan Agricultural College issues circulars with the above title, in co-operation with the Extension Division of the U. S. Department of Agriculture. The May letter by that active worker, B. F. Kindig, drew our attention very especially because he quotes extensively from our editor's address of the past winter to the Michigan State Association, on "Large Hives." That subject seems uppermost in many minds, among beekeepers. We even find it discussed at length, at the antipodes, in the April number of the Queensland Beekeepers' Association Journal. The idea of large brood-chambers is apparently accepted everywhere. The Europeans accepted it long ago, with the movable frames. The only question debated now in this country is: "In what shape should the large brood-chambers be used?"

The Beekeepers' Letter above mentioned also calls attention to the occasional similarity in appearance between American and European foulbroods. The statement is made that the two diseases rarely appear in the same colony at the same time. Are we very sure of this?

Beekeeping for Disabled Soldiers

"Vocational Rehabilitation Series" are issued by the U. S. Government for the benefit of disabled soldiers. Number 37 of this production is entitled "Beekeeping," contains 32 pages, a number of fine cuts, and indicates how cripples may succeed and **do succeed** in beekeeping. We cannot expect many of our disabled soldiers to take up beekeeping. It requires special tastes and aptitudes. No man who dislikes the work can succeed in keeping bees. But if the opportunity opens its door to a few, as it is sure to do through the help of these monographs, much good will result. Too many people slip away from the farm, expecting both more remuneration and more leisure in city pursuits. They soon find those prospects elusive and anything which will draw them back to the farm, or at least to the suburban plots, must prove a step of value to the country. Go back to the country, you city dwellers, and become producers as well as consumers.

THE PASSING OF EUGENE SECOR

A Tribute to a Beekeeper Who Was One of Iowa's Best Known and Most Beloved Sons, and Who Was Widely Recognized in Other Fields

By Frank C. Pellett

MANY hearts were saddened by the word of the death of Eugene Secor, of Forest City, Ia. Gored by an angry bull, on May 14, he died the same afternooon. It falls to the lot of few men to bind the hearts of so many in the ties of friendship as he did. Eugene Secor was one of the world's noblemen. He was not a specialist and did not rise to great eminence in any field, yet he was a leader in several. It was as a horticulturist and beekeeper that he was most widely known. He began contributing to the pages of the American Bee Journal nearly forty years ago. For many years he was prominent in the beekeeping field, having served as Vice President, and later as President of the North American Beekeepers' Association; the name was later changed to National. He was afterward treasurer and general manager for a period of six years. Mr. Secor was selected as the sole expert judge of the apiary department of the World's Columbian Exposition held at Chicago in 1892-93, and later served in the same capacity at the Omaha Exposition. For many years he judged the bee and honey exhibit at the Iowa State Fair.

It was during the years of Mr. Secor's greatest activity that the National Beekeepers' organization reached its greatest success, and undoubtedly his efforts contributed greatly to that end. It was as a writer of songs and poems that he, perhaps, became best known in the beekeeping field. Several of these songs were set to music by Dr. C. C. Miller and George W. York and sung at the beekeepers' conventions. "The Hum of the Bee in the Apple-Tree Bloom, "Buckwheat Cakes and Honey" and "The Beekeepers' Lullaby" were sung in hundreds of beekeepers' families a generation ago.

As a horticulturist our friend was known from one end of Iowa to the other. His home, "The Shelter," at Forest City, was surrounded by one of the finest collections of trees and shrubs in the middle west, and fortunate was the nature lover who found himself a guest in that home. Mr. Secor and daughter, Miss Nina, were able to make their guests feel very much at home, and delightful was the atmosphere of the place with its wealth of books and magazines, inside, and flowers out-of-doors.

With his bride Mr. Secor settled at "The Shelter" more than fifty years ago. All, excepting a few old trees there, have been planted by his own hands. Few trees and shrubs hardy under Northern Iowa conditions are missing from the collection, and hardy, herbaceous plants have not been overlooked. Plant breeding has been a fascinating pursuit for many years. Crossing the peony was a specialty which claimed his attention for some time past. I have nearly two dozen new varieties which were originated in the Secor gardens and they are a never-failing source of pleasure to me. The fact that they were the result of my friend's dreams and the parent plants were crossed by hand pollination, in an effort to work out the types which he desired, add greatly to their value to me. The collection at the "Shelter" included many hundreds, and they are a wonderful sight at blooming time.

The Secor home at Forest City.

There has probably not been a volume of the reports of the Iowa Horticultural Society that has not contained some contribution from the pen of Eugene Secor. He was at one time President of that organization, and for many years a director. At the time he first settled in Iowa the State was very new, and little was known of the varieties of fruits which would be suited to its special climate. He went through all the painful process of planting hundreds of varieties which could not stand the rigorous winters, or the hot, dry summers, and suffered the disappointment that always comes through losing a coveted variety. Most of the joy of life to the nature lover comes through the acquaintance with new varieties, and Eugene Secor tasted to the full the pleasure that comes to the man of scientific turn of mind from investigation of nature's secrets. In addition to his beekeeping and gardening activities, he was a breeder of shorthorn cattle, and for many years was President of the Farmers' Institute of his county, and also of the Winnebago Agricultural Society. Not only was he active in various lines of agriculture, but in business as well. As one of the founders of the City Bank, later the First National Bank of Forest City, he was closely connected with the commercial development of his town and county.

As a churchman he also rose to leadership, having been a delegate to the General Conference of the Methodist Church, to which denomination he belonged. He was also a member of the Board of Trustees of Cornell College, of Mt. Vernon, Ia., for several years. In politics he was also successful, having held several offices, including a seat in the House of Representatives, and also the position of postmaster of Forest City.

Our friend was a well-balanced man. Everything which interested him he investigated thoroughly, but he did not become warped in his judgment and narrow in his views through too close attention to one subject. His indomitable spirit was not crushed by adversity and his life offers a fine example for the young manhood of his community. Seven of his ten children died before he did and his wife preceded him in death by seven years. No matter how great his loss, or how deep his cause for anxiety, he was always genial and uncomplaining.

He continued his interest in bees until the end, but only with about

twenty colonies, since he was no longer equal to the physical exertion necessary to care for a large number

I count it a great privilege to have known Eugene Secor intimately and, in common with others, feel a sense of great personal loss in his going. His memory will be cherished in many breasts to the end of life, as the following poem, clipped from his home paper indicates was his greatest wish:

If I Should Die Tonight

An atom in the vast universe,
A bit of star dust in a field of light
Am I, nor would the world its course reverse
If I should die tonight.

The air is full of spirits of the past,
Spirits that once to the flesh were clear to sight;
Forgotten all, as I shall be at last
If I should die tonight.

But deeds, not men, are what alone survive,
Pure thoughts are angels clad in garments white.
Will words or deeds of mine remain alive
If I should die tonight?

Shall one kind act, one unremembered wrong,
One helpful word by me to cheer the right,
One phrase remain to speed the truth along
If I should die tonight?

Of all the ones I know who call me friend
Would one, just one, for life keep memory bright
With some sweet thought I spake while here, or penned,
If I should die tonight?

—Eugene Secor.

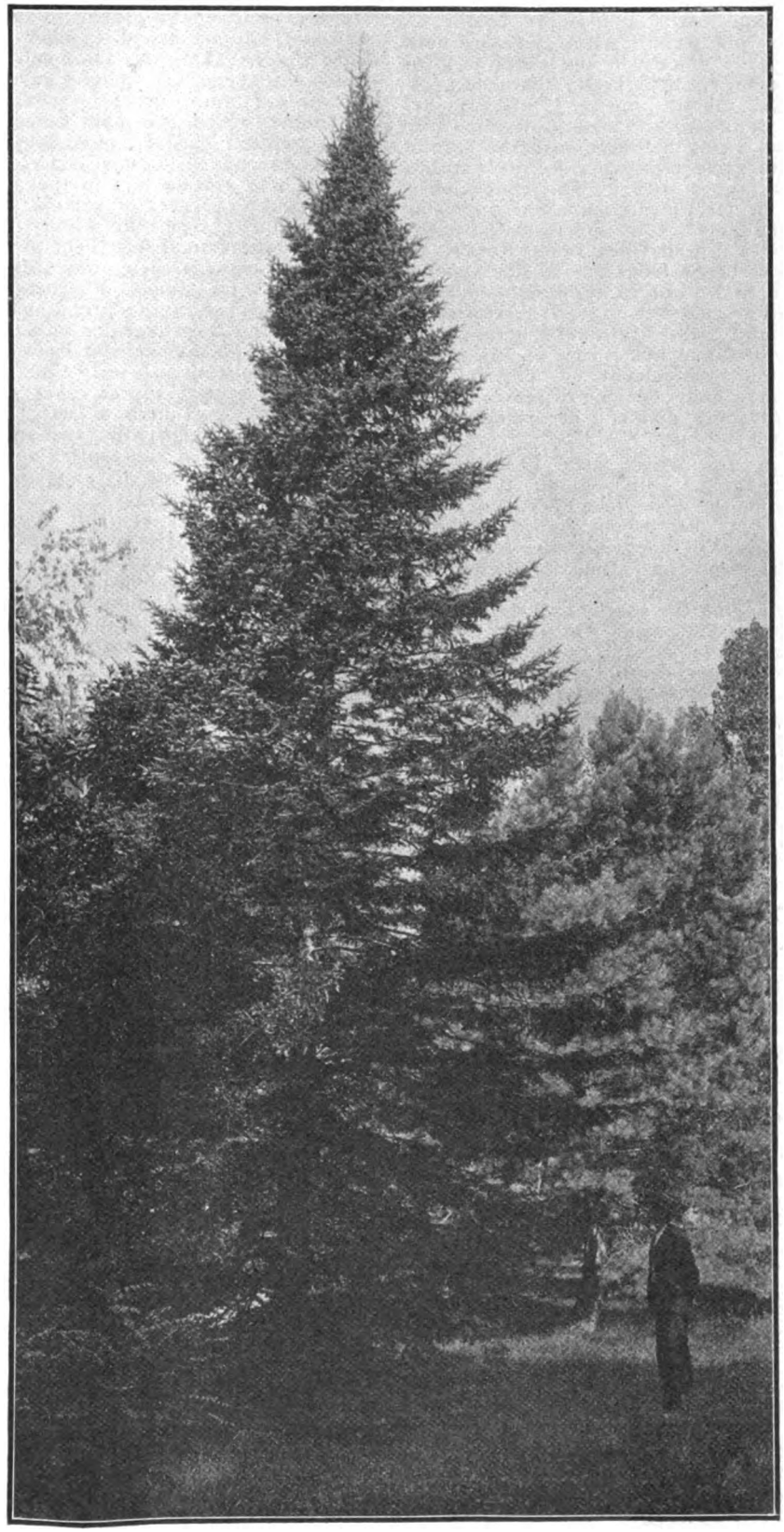
Troubles With an Obstinate Queen

By G. C. Greiner

WHEN I first changed from the production of comb honey to that of extracted I knew from former experience that a clean, appetizing article could not be produced without the use of excluders. I had occasionally used an extractor for the purpose of reducing an overplus of honey from the brood-chamber. Some of the combs from which I intended to extract the honey contained, quite frequently, more or less brood in different stages of development, and it was next to impossible to extract the honey without disturbing the brood. Even with the slowest motion of the extractor that would throw out honey at all, quite a showing of different sized larvæ would be floating on the honey.

This decided the excluder question for me. The first dozen I used did not prove satisfactory. They were of earlier days' make and the bee-passages were much too large, giving the queens access to the supers in too many cases. Of course, I discarded them and instead tried the regular standard make of the present day, having .163 inch perforations. But these, too, did not entirely satisfy me; they excluded the queens all right, but I mistrusted they were honey excluders as well as queen excluders. After that I used excluders with .172-inch perforations. I could not find them in market, but had them made on my special order. I am not positively sure that I get more honey by their use, but they certainly are easier for the bees to pass through them, and they exclude queens as well as those finer ones with .163-inch perforations.

The reason why I have bri fly outlined my excluder experience in the



A corner of the Secor home grounds at Forest City. Mr. Secor had the finest collection of trees and shrubs in Iowa.

foregoing is because the excluder plays a prominent part in my queen story that follows.

The queen in question was the head of a colony I purchased early last spring. At the time I made my divisions, May 12, she was left with two combs of brood and the necessary filling out of the hive with division-boards and empty combs on the old stand. After that she built up her colony in the usual way, or perhaps a little better than the average. About June 15, a few days before the white clover flow came into full swing her hive with the rest of the same class received its extracting super with a .172-inch excluder.

In due time, when I was preparing to supply second supers to the needy hives, I found her super stocked up with brood from side to side and the queen on one of the combs, but the brood-chamber, as I afterwards found, was full of honey and pollen, and not a sign of any brood. This arrangement did not suit my fancy, and I decided to rearrange her ladyship's domicile according to my own notions.

A few days later I made the change. I removed all the combs from the brood-chamber and transferred the brood, queen excluded from the super into the former, at the same time filling the super with empty extracting combs and exchanging the coarse excluder for one of the finer type. On paper this operation looks easy, or even with hive and super empty, except combs, no particular hardships are encountered, but when both are crowded with bees it is anything but an agreeable job. I disposed of the crowded super easily enough by setting it, covered up, on an empty hivebody behind the hive, but when I took the combs from the brood-chamber, the bees seemed to lose all self-control. Smoke had no effect on them. They were running in all directions, over the frames, up and down the sides and ends of the hive, onto my hands and arms, over the edges of the hive, etc., and when all the frames were removed the hive-body, inside and out, was black with bees. And with such general uproar the operator has no inkling where the queen may be. To save her from possible harm all handling of the colony must be done very cautiously.

Transferring the brood from the super to the brood-chamber was comparatively an easy task; the bees had quieted down to almost normal and objected very little to the handling, and as the queen was found on one of the combs also, all my anxiety in her behalf was removed.

When I examined this hive the next time, a week or ten days later, I again found eggs and young brood in some of the combs above the excluder, and the queen presiding over the newly-established household. She did not remain there very long. I shook her on the alighting board and saw her safely enter her proper home. The brood, which she had started above, I scattered among solid combs of honey, expecting that that would settle all disputes in regard to her home claims for all time to come.

About two weeks later, when the dark honey flow was well under way and other colonies needed more storage room, I expected that this queen (or her colony) would need another super, too; but to my surprise and annoyance found her super to be a well-stocked-up brood-chamber a third time. Taking out the comb on which the queen was found I gave it an unceremonious shake in front of the home, which she had deserted twice before. I have not seen that queen nor opened her hive since.

As it was getting late in the season and the prospect of getting any surplus honey from the colony extremely uncertain, I left them to arrange and manage their home affairs to suit their own fancy. Whether the queen remained in the brood-chamber after the third transfer or again passed through the excluder I did not find out. It being so nearly time for the adjustment of winter cases and winter packing, I built a two-story case around this now two-story hive and provided substantial packing the same as for all single-hive colonies.

The contrariness of this queen, with perhaps a little undue persistency on my part added, cost me, roughly estimated, about 100 pounds of surplus honey last summer. All in all, I extracted from this colony, mainly from the brood-chamber, about 40 pounds, while the rest of my yard averaged over 200 pounds, of which nearly one-third was comb honey. Had I been a little more indulgent with this queen and granted her the privilege of using that super for her brood-chamber, as she seemed to prefer it, one or two supers of surplus honey from this colony would have been almost a certainty. Placing a second and third super with another excluder on the first one would undoubtedly have produced the desired result.

La Salle, N. Y.

To Get Rid of Foulbrood

By Lieut. Alin Caillas
Ingenieur Agricole, Chimiste de la Societe Centrale d'Apiculture.
Etat-Major de la Division, Secteur Postal 41 (France.)

ALL apiarists know, at least in name, this illness, which is common in several parts of France. Its ravages are most important. I know of entire regions, that are privileged ones as regards climate and flowers, but where beekeeping has become practically impossible, on account of the extension and propagation of this awful plague.

Plague is no exaggerated word for it; foulbrood may be compared, keeping in proper limits, with Indian plague, cholera, Spanish influenza or, —to leave out human diseases—with pebrine and muscardine that threatened, some fifty years ago, to destroy French silk-husbandry. But Pasteur was on the lookout, and thanks to his learned workings and patient researches, a remedy was found.

Our apiarists have, generally speaking, but small information, vague and imperfect data on this question. Things do not stand so abroad. Cheshire, in the year 1885, Maasen, 1907, Dr. White, of Washington, Professor Zander, 1910, discovered and studied the **bacillus alvei,** the **bacillus larvæ,** the **streptococcus apis,** the three of which bring about, under different forms, the illness commonly called "foulbrood."

During a recent furlough which I spent on the Cote d'Azur, in that enchanted seaside country all strewed with flowers, where carnations, roses, mimosas give the land a matchless ornament, I was fortunate enough to renew old acquaintance with one apiarist whose name is well-known to all readers of this journal—Mr. Ph. J. Baldensperger.

Mr. Baldensperger may be called an apostle. A long life of learned workings, all devoted to the study of bees, makes him an uncontested master in the matter. He has traveled in nearly all parts of the world, speaks and writes English, Italian, German and Arabic as well as French; so that he certainly is the best qualified apiarist of our times and the most learned and most enthusiastic one I know of.

Moreover, his enthusiasm is catching. During our walks in the environs of Nice, our conversation often came to the subject of foulbrood. Mr. Baldensperger knows it well, for he had to suffer damages through it. He has noticed its effects, but, in spite of his thorough science of apiarist, it remained for him without any remedy.

Yet, in the course of his long researches, he had the good fortune of coming into relations, at the Societe Naturaliste de Nice, with a learned and distinguished biologist, Mr. A. Prudhomme, of the Paris and Strasburg Universities, a former scholar of the Institute Pasteur.

For such a learned a gentleman as Mr. Prudhomme, the question of foulbrood could not fail to be an attaching one. Quickly, he read and studied all that had been written and done about that question, so as to well master it. Then he applied modern methods to cultivating the three microbes which we have named above, and he succeeded, after patient researches, in cultivating, isolating and fixing them.

The microbes of foulbrood develop in the intestines of the larva; they may be compared in all respects to those of Eberth (typhoid fever.) Now, typhoid fever can be treated in accordance with two methods—ordinary vaccination, or entero-vaccination, i. e. vaccination absorbed through the digestive tube.

Mr. Prudhomme succeeded in bringing about a polyvalent entero vaccination, i. e. virus that can be opposed to the infection brought about by the several bacterias of foulbrood. I beg leave to quote here his own words:

"The cultivation grounds to be chosen were a most serious difficulty,

but the previous workings of the above-named authors had prepared the way, and so I was able to cultivate on choice grounds for every one of them the various bacterias in question, including the bacillus larvæ, the cultivation of which had remained practically impossible heretofore. It was then necessary to stabilize these cultures. This has been carried through, too, and already for months I have been able to bring out a polyvalent virus that is satisfactory in every way. The virus, enclosed in a glass ampulla, should be mixed with a kilogramme of honey or of sugar syrup, and this should be given as food to the polluted beehive. The contaminated larvæ are lost anyway, but the infection ceases, the new larvæ being fed on this mixture do not catch the disease, the laying of the queen does not stop, the active life of the swarm is carried on and, as the population keeps on a sufficient level, the plundering of the hive is avoided. After a fairly long time, generally over one month, the effects of the illness have disappeared."

Mr. Prudhomme's experiences are to be considered as quite conclusive. But, according to the author's wish, these experiments should be repeated as often as possible, not only in the several regions of France where foulbrood has spread itself, but also in foreign countries.

Mr. Prudhomme is at the disposal of all apiarists to forward them, free of cost, the virus he has brought out, the making of which he keeps a secret. All necessary information will be given. In return, apiarists are requested to kindly report their observations and the results ascertained.

By repeating such tests, by renewing them in the most varied situations and circumstances, we may hope, with the help of all interested, to succeed in wiping out the dreadful plague that threatens to annihilate forever a most important source of our national riches.

Virus can be obtained from Mr. Prudhomme, Chimiste Biologiste, 1 Rue Cotta, Nice (Alpes-Maritimes), France.

(This is very interesting. But in the case of what is called in this country "American foulbrood" or "bacillus larvæ," it is out of the question to bring about a permanent cure without doing away with the contaminated combs, for the reason that the dead larvæ are fastened to the lower cell-wall of the cells in such fashion that the bees can rarely remove them. As to the other disease, which Dr. White calls "bacillus pluton," and which we have reasons to believe is the same as that described by Cheshire under the name of "bacillus alvei," the case is different, for the bees easily remove the dead brood.

The reappearance of bacillus pluton in an apiary, after the disease has been considered cured, might be prevented by a trial of the method above given by our learned friend, Lieutenant Caillas, provided the virus be not too expensive. In this country, profitable beekeeping is carried on in large apiaries, and any method, to be successful, must admit of the treatment of all the colonies in an apiary. That is why so few of our experienced apiarists are willing to depend upon any drug system. But it is well proven that the bees need never be killed to do away with the disease; neither is it necessary to burn anything but the combs actually containing the dead brood, and that only in the case of "bacillus larvæ."

We are just beginning to learn how to treat the different bee diseases, and it behooves us to listen to all suggestions and to give trial to all the plausible methods.)—Editor.

Smoke Introduction

By Major Shallard

I AM always at a loss to account for anyone failing in queen introduction by the smoke method. I first used this over a quarter of a century ago. I have used no other since, never having any need to. I was rather amused at its discovery (?) a few years ago by Mr. Arthur Miller. Every now and again someone reports a failure by the method, and that is what puzzles me. Then rather elaborate instructions are given on the subject. The queen must be run in under certain conditions and so many puffs of smoke must be given, etc. One of the editorials of a bee journal said that to insure success it was imperative that the hive be free from cracks and tight enough to hold the smoke.

I find none of these precautions necessary. I just flop the queen in any old way and apply the smoke, and introduction has become such a simple matter with me that I feel that I could drop a queen into a hive and throw my hat at it (at the hive, not the queen) and it would be safe (the queen, not the hive).

I do not make any claim to have any special skill in queen introduction. Rather do I contend that no skill is needed. The whole matter is summed up in the word "demoralization."

The bees "dunno where they are" and in that condition anything can be done with bees, or anything else. You get an unbroken colt out of the bush; put a halter on him, as soon as he is quiet enough to let you; tie his head to his tail and then frighten him, and he will turn round and round like a top until he gets giddy and does not know what he is doing. Get the harness on him quickly and you can drive him like an old stager, simply because he is demoralized. Do not make the mistake of keeping him in the harness too long or he will get his senses back and kick the stuffing out of the vehicle. It is just the same with the bees. Get them befuddled and they do not know one queen from another, and, in fact, are not sure whether they previously had another queen at all. On one occasion I was introducing a queen into a very leaky three-story hive and I heard a strong hum over my head. I found the bees were pouring out of the top story and lighting upon a bough. They were dark scallawag bees, and while I was looking I saw the new queen settle among them. She, being bright yellow, was very conspicuous. I put them back and as the genial Dr. Miller would say, "they lived happy ever after." Some claim that the method will not act with two-story hives and three-story ones are impossible. This is all tommy nonsense. It will act with any hives of any size, any make and almost any leakiness. It is simply a matter of giving enough smoke. A big hive obviously needs more smoke than a small one and a leaky one more still. My method is simplicity itself, I kill the old queen. Have a piece of flat wood large enough to close the entrance. I put the hive together and just before pulling the cover on I drop the new queen down between the combs at the top. I then put the top on, close the entrance with the board, all but half an inch. I puff **cool** smoke into the hive until the bees roar,and they fight to get out at the entrance. After they are thoroughly upset from top to bottom of the hive I cease smoking and close the entrance altogether. After three to five minutes I open the entrance slightly, and if they rush out I close it and try again in another couple of minutes, when they will have settled down and very few, if any, will rush out. Then open the entrance full and the trick is done. It is as easy as falling off a log, as sure as death.

Australia.

"Honey Yellow"

By Allen Latham

IF one hundred people, acquainted with honey but otherwise chosen hap-hazard, were asked, "What is the natural color of honey?" what would be the composite answer? This question is raised for a two-fold reason; first, because better sales of honey would result on account of greater confidence of the buying public were there greater uniformity in the color of bottled honeys. If the darker honeys were diverted to other uses than bottling and if the colorless honeys were blended with the ambers for the bottling trade, the result, I believe, would be greatly beneficial to the honey trade. In fact, some of us producers are already doing that very thing, and, in the East at least, blended honeys will put other kinds out of the market.

The second reason is, perhaps, of less importance, but has importance from an educational standpoint. This second of the two reasons that have led me to raise the question under discussion is the injustice so often done in judging honey exhibits at fairs and food exhibitions. It has come under the observation of the writer that few judges can get away from the notion that the less color a honey has, the better the honey. Too many times have I seen first premium awarded to a honey almost without color, while other honeys in the contest, possessing some color, surpassed the prize honey in body and clarity.

Should honey be free from color? Last fall the writer acted as judge

at a certain fair. Under the exhibit of light honey were two close competitors for first place. One of these was practically colorless, while the other was a light amber. Had the second had less color, had it been golden in tint, there would have been no question about the placing of the award. But the second was almost too dark in shade, while on the other hand, the first was too pale. The second, though rather strongly colored, was awarded first prize on the ground that it possessed a better flavor and was superior in clarity. Several persons present questioned the judges' decision and asked whether a mistake had not been made. When the matter was explained to them they saw the justice of the award.

Now, for a fact, only a few honeys are colorless, or what might be termed colorless. Basswood, alfalfa, clethra, goldenrod, aster and alsike clover are practically the only honeys seen in the East that could be termed colorless, and often many, if not all of these, possess considerable color. California produces some almost colorless honey, and there are plants in the South that produce water-white honey. Against these can be named a host of blossoms that produce honeys that are tinted with yellow or red. Some of the noblest honeys of all are thus tinted. Raspberry, unmatched for eating, is tinted. Clover, by many considered the prime honey of all honeys, has a yellowish cast. Sumac produces a honey which has a beautiful golden cast, and connoisseurs, the country over, pronounce it the best of all. Apple-bloom honey, in the opinion of the writer the very nectar of the gods, is distinctly golden. Orange-bloom honey, much like that from apple blossoms, captures the palate of many honey lovers. When it comes right down to enjoyment of eating honeys, there are few colorless honeys that have that property termed tastes-like-more to the same extent that other honeys which possess some color must be credited with.

The buying public, though largely possessed with the idea that the best food is white—white flour, white sugar, white rice, cream of wheat, white corn—will pick honey with a tint rather than that which is colorless. The impression has long been present that honey is naturally yellow, and so we often run across such expressions in printed books as "honey color," "honey yellow," "golden honey," etc., all of which expressions either in themselves, or by the context, convey the impression that, the world over, honey is thought of as of a yellowish or golden color.

If this is the general impression, should a colorless honey rank higher than a golden honey? I for one, should say no; and to revert to the question submitted to a hundred honey consumers, I think the answer from the vast majority would be "yellow or straw color."

The Century Dictionary defines a pure honey as "of a whitish color, tinged with yellow." Evidently the authors of that book are not acacquainted with the chocolate honey of buckwheat, the red honey from huckleberry, the water-white from clethra. But that definition confirms my contention that honey is usually thought of as having some color, and that color yellow.

It is not wise to work against a strongly ingrained public opinion. If people in general think of honey as yellowish or golden, then we honey-sellers should try to attain that color in our bottled goods. By doing so we shall help to increase the sale of honey.

Norwichtown, Conn.

Mr. Barbeau preparing queen-cells by his new method.

The Barbeau System of Queen Rearing

WE have received the following letter and accompanying cuts from Mr. E. Barbeau, of St. Eustache, Quebec:

The enclosed photos illustrate the queen-rearing system which I have invented. It is exceedingly easy to operate. It consists of:

One cylindric punch.
One pusher.
Waxed aluminum capsule tubes
Royal cages.

The cylindric punch is used to cut, out of the comb, one cell containing a larva one day old, to have the latter developed in a queen-cell.

In order to use it with success, it is advisable to rub a little vaseline on the inside and outside of this punch, so that it will not stick to the comb.

The waxed aluminum capsule tubes are used to receive the cells from the punch after they are cut; you simply push the cell from the punch into the capsule tube, by the use of the pusher.

It is not necessary to put any royal jelly in the cells to induce the workers to start queen-cells out of them, when conditions are right. They do it of their own accord.

The royal cages are used to keep the queens prisoners after they are hatched.

Nothing is easier than these operations. After preparing 30 or 40 capsules or more, you screw them into a comb which you place in a colony which has been made ready for queen rearing.

I trust the above information is sufficient to make anyone understand my system.

Swarm Impulse

By Arthur C. Miller

TO write something which receives commendation from Dr. Miller is indeed gratifying, but so to express one's self that part of what one says confuses him is most regrettable.

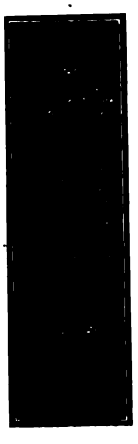
Yes, Doctor, I did mean that there is no more danger of having swarming impulse inherited through swarming cells than through cells reared in any other way from the same colony. I believe that biologists are now pretty well agreed that acquired characteristics are not transmitted through inheritance, and it is absurd to believe that food from swarming bees could impart the swarming impulse to queens they reared and fed. We would as soon expect a baby brought up on cow's milk to moo.

I go farther, and question how far it is true that some varieties or strains are much given to swarming. I know that such is common belief, but I think external factors are largely instrumental in exciting the swarm impulse. But some strains may be more susceptible to external influences.

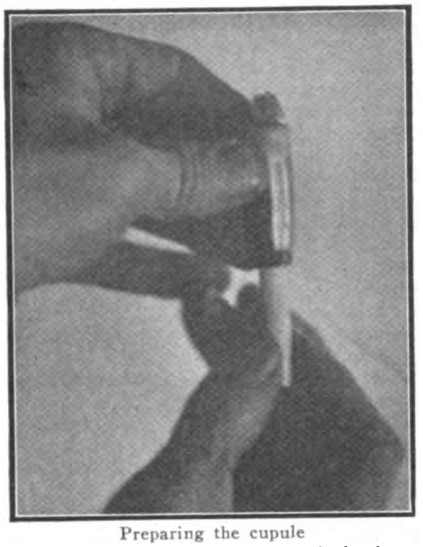
Reproduction by division (swarming) is doubtless an inherited trait of bees, but that an increased tendency to so divide exists and is inherited I do not believe. As an example, the Carniolans are said to be great swarmers. But here we have an Alpine bee, taken from high altitudes, a bee whose constitution is adjusted to a rarified and a relatively cool atmosphere, and we subject it to our lower altitudes and hotter climate. In its native home it has not a reputation for excessive swarming. Is not its swarming habit here due to its reaction to external conditions? What would be the result if we should take some of the swarming Carniolans of our low lands and put them well up in our mountain regions? (I venture to assert that the excessive swarming would disappear.

It is not partucularly difficult to start the swarming impulse in any colony of normally well-behaved bees by sundry manipulations, such as adding drones and drone-brood and an excess of young nursing bees.

As to leaving a ripe and just-started cell, I do that to guard against



The Barbeau queen cage.



Preparing the cupule

hopeless queenlessness, and it is done when a swarm is returned without the old queen, or when the old queen is removed to prevent swarming. I have found that the very young cell is generally allowed to develop until the queen from the ripe cell is mated. If she is lost in her wedding flight the colony has something to take her place. Not so with two cells of nearly the same age, for the second one is pretty sure to be destroyed soon after the first hatches. All of my yards are at a considerable distance from home and are not visited often, so some plan seemed necessary to guard against disaster from queen loss.

I am aware that such a colony may swarm when the first virgin flies to mate, but in this locality, with our slow honeyflows, they seldom do. But swarming is rare among my bees, so perhaps my experience is not great enough to be a fair criterion of the plan.

Providence, R. I.

Glad we are agreed on your first proposition. If queen-cells are to be used from a certain colony, I would make no choice between swarming-cells and those reared under the hand of an expert at some other than swarming time. But if the matter is in the hands of an inexperienced beginner, I would much prefer the swarming-cells.

You believe that under certain conditions Carniolans will not swarm more than others. Well, that doesn't particularly interest me; if they swarm under my conditions, it's immaterial to me what they do under other conditions. The thing that interests me is that under my conditions there is a greater tendency to swarming in Carniolans than in others, and it seems to me they get that tendency from their folks. If you have some other name than heredity for it, well and good.

As to that matter of leaving two queen-cells, there seems to be something of a tangle, and I suspect if we were face to face we would be likely to be found of the same mind. In November, 1915, American Bee Journal, page 379, you say: "Usually I then cut out or destroy all but two cells, leaving two of as nearly the same age as possible." In your present article you speak of "leaving a ripe and a just-started cell." Must be some muddle somewhere.

Going back to my article on page 55, February Journal, I quoted you as saying: "When two cells of nearly the same age are left, one is destroyed soon after the first hatches, but not so when one cell is very young, or just started." And then I said: "I've always supposed it was just the other way around." I can now see that our misunderstanding may have arisen from the fact that I had in mind swarming and you didn't. For if two cells of nearly the same age are left, I should not expect one to be destroyed soon after the first hatches, but to be cherished and allowed to reign after the departure of the first with a swarm. If there is to be no swarming, then I would expect that the older the second cell, the sooner it would be destroyed.

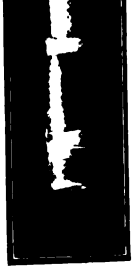
C. C. MILLER.

Rearing Queens Over Queenright Colonies

By C. C. Miller

IF a colony has its queen taken away during the working season, the bees will start queen-cells upon some of the young worker-brood present, and proceed to rear a queen. Entire removal of the queen is not absolutely necessary to give the bees a feeling of queenlessness, and to make them act accordingly. It is well known that if all but one or two of the frames of brood of a colony be raised from the brood-chamber and put in a second story, there being an excluder between the two stories with the queen in the lower story, the bees will be pretty certain to start queen-cells in the upper story.

It is perhaps quite commonly thought that this is because the queen cannot get into the upper story. It is, however, a matter of "does not" rather than "cannot." Instead of an excluder between the two stories, let a sheet of heavy cotton be placed over the frames of the lower story, the sheet, being small enough for the bees to pass back and forth at the sides or corners. The queen can pass up and down as well as the bees, but she **does not,** and so



The Barbeau system requires very simple tools.

long as she does not the bees will start cells in the upper story as promptly as if the queen-excluder were present.

The distance of isolated brood from the queen is a matter of importance. The first case on record of a queen being reared over a laying queen of which I have any knowledge occurred in this wise: I had a number of empty brood-combs that I wanted to protect from the moth, and I piled four stories of them over a medium colony. Fearing that the bees might not reach the combs farthest from the brood-nest, I put one or two frames of brood in the upper story. Later on, upon opening the hive, I was greatly surprised to find in the upper story a nice little brood-nest and a young queen laying. There was an opening at top from which the young queen could take her wedding flight, and she had evidently not invaded the domains of the reigning queen below. In this case there was no excluder, and nothing to prevent free passage from top to bottom; so it was the mere matter of distance that gave the bees the feeling of queenlessness.

Since then I have had a number of cases in which the same thing occurred without any intention on my part. In a number of cases I have also designedly put brood above, in order to rear a queen, but failed every time. I don't know why. I think others have had better success.

There seems to be a difference as to the degree of intensity of the feeling of queenlessness on the part of the bees, perhaps dependent on the degree of isolation. The closer the isolated brood is to the queen, or the more open the communication, the less the feeling of queenlessness. Perhaps, also, there may be a difference in the bees themselves. A colony with a young queen is not so likely as one with an old queen to start cells over an excluder. Indeed, one is not always entirely sure that cells will be started, whether the queen be old or young. But practically always one may be sure that if cells already started are given over an excluder, with a laying queen below, such cells will be respected and treated just the same as if they had started the cells themselves. They may not feel queenless enough to start cells, but they do feel queenless enough to take care of them and continue them if cells are already started.

In all of this the excluder in mind is the common zinc queen-excluder. The result may be a little different with the wire excluder, on account of its greater openness. In the American Bee Journal for December, 1918, page 412, W. J. Sheppard says: "It was found that when the new queen-excluder was used, the bees, as a rule, would not build queen-cells, except when a shallow super was put above the first story, and a second wire excluder over that * * * But if an ordinary zinc excluder was used instead of a wire one, there was no difficulty in getting the bees to build queen-cells."

We speak generally of rearing a queen over an excluder. It may be under, or it may be at one side. I think, however, that bees over an excluder feel more keenly their queenlessness than when under or at one side.

When, then, we desire to rear queens in a colony with a laying queen, we may feel about sure that cells will be started if the story containing the brood be separated from the story containing the queen by an extracting super and an excluder; that they will generally be started if a zinc excluder is used without the extracting super; and they will generally not be started when a wire-excluder alone is used. Also, that if cells already started are given, we may feel quite sure they will be continued if a zinc excluder be used. With a wire-excluder I'm not sure whether we can count on their being continued unless an extracting-super also intervene. Marengo, Ill.

A Successful Queen Breeder

By E. G. Carr

MANY types of persons keep bees, and when a queen-breeder is able for twenty-five years to satisfy, with hardly an exception, these various tastes, one wonders how it is done. Such a queen-breeder is Lloyd H. Robey, of Worthington, West Virginia.

Mr. Robey was born in Lumberport, not far from his present home, in September, 1850. He was left fatherless in early childhood, and at the age of 12 started to learn the shoemaker's trade. He became expert, and so mastered the tools of the trade that, to use his own words, "If I were going to build a house I would use the shoemaker's tools." He uses a crooked sewing awl for a grafting tool.

Bees were taken up as a side line with the hope that they might prove profitable in honey production, as too close confinement at the shoe-bench had brought on considerable digestive trouble. Finding the nectar supply insufficient to make honey production profitable, Mr. Robey took up queen-rearing, and after having mastered the intricacies of the business, began, in 1891, to supply queens to the trade. From that time his business has grown until the output the last few seasons has been about 3,000 queens.

Mr. Robey uses the hand-made "Doolittle" cell-cup and grafts into them the smallest larvæ which can be handled, after priming the cups with "royal jelly." They are then given to a colony which has been prepared for cell-starting by removing it from its stand and in its stead placing a hive containing four combs of honey and pollen and one frame of brood. The bees from about four combs from the removed colony are shaken into the prepared hive and in five hours, or about noon, fifteen grafted cells are given, after the frame of brood has been removed. The next morning the started cells are put in the upper story of a strong colony for completion. The cell-starting colony is then restored to its former place and condition and in two days the process is repeated.

Frames for the mating hive are of such size that three will fit into a Langstroth size frame. Two or three are used for a nucleus. Twin mating hives are used, as are also some holding four nuclei.

Formerly these were stocked by fitting them into the "L" frames and placing in a colony. Later, bodies were made of such size that they would carry twelve of the small frames crosswise, two such bodies being used as a colony.

As a rule, ripe cells are given nuclei.

Late in the season, when the tendency is to feed the cells poorly, sometimes the larvæ are removed from the cups, where they have been fed for two days and replaced with newly-hatched larvæ, at the same time shaving down the cups with a hot, sharp knife. This insures well-fed larvæ.

Mr. Robey imports breeding queens every two years. However, before these are used for breeding they are tested, usually for two years, to guard against introducing any undesirable trait.

Drone mothers, as well as queen mothers, have always been selected by Mr. Robey. It is noted that this point is now receiving much more attention than formerly.

Mr. Robey's experience has been that only the first batch of supersedure cells have proven satisfactory. He has often found the returning mated queen accepted in a queenless nucleus.

Mr. Robey shipped queens to F. W. L. Sladen, in England, twenty years ago. He successfully sent queens to British Guiana, using a 12-hole cage and about one-half pint of bees. The queen was on the road twenty days.

For a number of years orders for the entire output of the apiary were booked by the first of May. In his dealings with the public Mr. Robey has assumed the same attitude as the Pullman porters, which is: "The customer is always right." It is possible he has satisfied some unjust claims, still he believes it has paid in advertising.

Because of the recent sugar shortage and the fact that he annually used 6,000 pounds, Mr. Robey has abandoned raising queens for the trade.

New Egypt, N. J.

The Baby Nucleus

By E. F. Atwater

WHEN the writer was attending high school, nearly twenty years ago, and keeping some bees, and thinking more about the bees than the school, it was his privilege to spend a few days with Mr. Thos. Chantry, at Meckling, S. D., and there saw in use a super divided into four compartments, something like the old Heddon super, in which separators could not be used, and in each compartment were two or more frames of 4¼ sections, and a nice, prosperous little nucleus in each compartment.

Mr. Chantry was very successful with these little nuclei, and succeeded in mating three or four queens, with the same quantity of bees as were usually used in a standard two-frame nucleus.

A year or two later, the writer came to Idaho to engage in beekeeping as a business, and one of the first moves was to establish a number of such nuclei, and these nuclei were seen in operation by Mr. E. R. Root when he visited here in 1901.

Results here, with our cool nights, were unsatisfactory, but with the publication of articles by Swarthmore, Laws, Bankston and others, a careful study was made of the entire matter, and every modification tested, as to size, as to age of bees, etc., and in 1904 a lot of nuclei were in use, folding like the Laws and Bankston nuclei, and containing one 4x5 section, and operated on the same plan of temporary stocking with bees, to be broken up as soon as the queen was found laying and later the same boxes were tested, with one section as before, and an old tough comb, with the cells removed on one side, and waxed in one on the little trays that constitute the hive-sides, giving the bees a chance to cluster between two comb surfaces.

These too, were unsatisfactory. Next, we tried the modified Swarthmore boxes, with two combs, about 4¼x5⅝, and these, too, were finally discarded. Then we built 50 nuclei on the Laws folding plan, with one regular shallow extracting comb, and these were a little better. Later these were changed into three shallow combs to each nucleus, but they were too long for the most economical use of a half-pint to pint of bees, so, as a last test of small nuclei, we adopted the regular standard frame, 5⅜x8, which were originally designed to be fitted three into a standard Langstroth frame, to get frames filled with brood and honey, for stocking nuclei.

D. M. Bryant, of Cliffview, Virginia, in his rosary.

This size proved to mate just about as many queens, per nucleus, as the larger Langstroth frame nuclei, and, where economy of bees is most important, is the best all-round size of nucleus frame.

However, we found that for the practical producer of honey, it is much better to use a nucleus that will hold at least 4 frames, as, if queens are mated, and not needed at once, turn the excluder over the entrance, so they will not swarm out, and given a frame or two, with starters only, when the little nucleus will work as contentedly as a full colony, and build down perfect worker combs. If all beekeepers contemplating the adoption of the small nuclei would adopt those, using the standard baby nuclei frames 5⅜x8, exchange of fine queens, and of select brood for queen-rearing, would be facilitated, as a little nucleus containing one frame of this size can be sent for a very small charge. For some years past the writer has dispensed with the cumbersome plan of fitting the baby nucleus frames into Langstroth frames to secure brood and honey in them, and was the first to devise and publish the plan of fitting a division across a 10-frame shallow super, as illustrated and described on page 92 of the American Bee Journal, 1917, without credit to the inventor.

Such supers are used as stock hives, and one or more colonies are at all times kept in them, from which a frame of brood or honey can be taken at any time.

When we wish to stock up a lot of baby nuclei, we put supers of such frames, filled with comb, on several strong colonies about the yard, give them a quart of feed about every hour, and by night the little combs are nicely stocked with honey, just right for making up nuclei.

Now, as to the reasons why the extremely small nuclei failed here. After all these years I am not sure of my reason, except that the boxes are so small as not to be adapted to the instincts of the bees, and hundreds, if not thousands, of the fine cells and virgins have been lost by these tests, most of which would have mated and been of value if a larger size had been used.

Meridian, Idaho.

Marketing Honey

By J. E. Crane

NOW, that there is a lull in the demand for extracted honey, is a good time to discuss the best way to dispose of our next crop. For those who have little time to market their crop perhaps it is just as well to sell to any buyer who is willing to pay a fair price for it, or turn it over to a reliable commission merchant who makes a specialty of selling honey. But for those who have the time and are willing to put in the work there are better ways for selling both comb and extracted honey. I know of one beekeeper who, although he runs a large farm, with dairy and several hundred hens, has found time to peddle out a large part of his honey, thereby saving shipping cases and freight bills, as well as commissions. Another way that will doubtless appeal to a large number of beekeepers that live near large towns is to put their honey in neat and attractive packages and place in grocery stores for the retail trade. A friend disposes of all of his honey in this way. If the demand is not equal to his supply he has placed a one-comb hive of bees in the store window to attract customers. The amount of honey that can be sold in this way is surprising. Another way, and perhaps the best way where one has a suitable location, is to retail from your own home to those who call for it. The location should be on a much traveled road. Of course, a sign should be hung up in plain sight of the highway, "Honey for Sale." But, better than this is to have the yard of bees set where it is easily seen by those passing. A good friend of mine, who has sold the past season his entire crop of some 10,000 pounds in this way, says his sales have nearly doubled since he cut away the trees between his yard and the road.

This method not only saves railroad freight bills, commissions and shipping cases and crates, but to a considerable extent containers also, for his customers who are acquainted bring their pails to be filled, but to those who do not he feels free to charge for a pail that he fills for them. He takes his surplus almost wholly in shallow extracting frames, extracting a part and cutting out the nicest to sell as chunk honey. He sells the comb and extracted honey at the same price, and his dark buckwheat, when he has it, as some prefer it to white honey.

Another method that has some merit is to put your honey in suitable packages for the retail trade and then travel from town to town and take orders and ship direct to the retail merchants; but the difficulty is that unless you can make large sales rapidly, which is not always easy to do, the expense of traveling and hotel bills will take all the profit over what you could have got from the wholesale buyer or dealer. Still another way is to put your honey in the most desirable form and let the wholesale grocery house, who has a large number of agents on the road, take orders and send them to you to ship direct to the retail merchant. If this method were very generally followed it would seem as though every retail store in the country might in a few years be supplied with honey. Of course, suitable literature and advertising matter should be supplied to those taking orders.

But how shall extracted honey be put up for the retail trade? This will depend much on the section into which it is shipped and those who consume it. A large demand is coming from restaurants, hotels and dining cars for individual packages holding

from two and a half to three ounces.

There is likely to be a large trade in this line in the near future if sufficient effort is made to develop it. Then there are those that want more than enough for a meal for one person, and a five-ounce, an eight-ounce and a fifteen-ounce package are needed, that the whole family may have not only a taste, but a full meal of it, with their bread. We put up honey in three sizes of glass, and three sizes of fiber, that can be sold for a little less than a glass. Then we have quarts in tin, and half gallons and gallons, as well as five-gallon cans, and have calls for honey packed in all of them.

By the way, one of the best methods of advertising is to put up under your trademark only a nice grade of table honey. There seems to be a feeling in many places that honey should be slightly amber and it may often be advisable to mix a small per cent of good-flavored amber with a very white honey to reduce the color a trifle, but care should be taken that it is not carried too far, and injure the quality and reputation of the bottler. The reputation of a beekeeper or a bottler is of much greater value than all that can be gained by reducing the standard of your goods, when once you have a reputation established.

What shall we say of comb honey? With sections costing nearly a cent a piece, and a piece of foundation large enough to nearly fill them, the best part of another cent; then with a carton to cover the comb another cent is required. But this is not the end, for we must have shipping cases that add another cent to each section, and a crate in which to ship our cases costing not less than half a cent more per section. The greater amount of work required to produce the comb honey, and greater amount of labor to pack it, will make it quite necessary that we secure a much higher price for it than for extracted honey to make it pay. The law that compels us to weigh individual sections and place the net weight on each section or carton, adds very much to the expense of packing. But there are some advantages in this, as it makes it possible to pack all the sections of the same weight in a given case. It is very easy to see that the retail grocer will prefer all his combs of the same weight and be willing to pay a little more when so packed. Again, there are some who want every section to look heavy and will pay more for fourteen or fifteen-ounce net sections than for lighter ones, while others are not particular, and some retailers are even willing to pay more per pound for the light sections. Plain sections weighing eleven ounces net look very well if no heavy ones are in the same case to compare them with, and sell very well. With the present craze for producing extracted honey, I believe the price of section honey is going to rule high for some time to come, and pay well those who are willing to produce, pack and market it with care.

DR. MILLER'S ANSWERS

Send Questions either to the office of the American Bee Journal or direct to DR. C. C. MILLER, MARENGO, ILL.
He does NOT answer bee-keeping questions by mail.

Outdoor Wintering

A few days ago I talked with a beeman and he told me he never packed his bees, but just left them on the stands as they are in the summer. He argued that when bees are kept too warm in winter they use up their stores and are without in the spring before time to gather more. He says his bees are doing fine. What do you think of this? ILLINOIS.

ANSWER.—I don't know how far south you are, but there are good authorities who say that anywhere in Illinois the bees are better off for protection. A strong colony may winter without it, but that doesn't prove that the colony might not do better still with it.

Queens—Italians, Etc.

1. If the queen should be killed on her mating trip would the colony likely be queenless, since this queen very likely destroyed all the other queens before starting forth?

2. If I have no bees in my apiary except pure Italians and there are no neighbors' bees within one mile, is it not certain that my queens will become purely mated?

3. Have you had experience with the various strains of Italians, as three-banded, leather-colored and goldens? fI so, which would you advise for gentleness and industry? ILLINOIS.

ANSWERS.—1. If swarm should issue, leaving in the hive no queen or queen-cell, and no young brood, the death of the queen would be the doom of the colony. But you are not at all warranted in saying "since this queen very likely destroyed all the other queens before starting forth." That's just what she is never allowed to do. When a prime swarm issues, young queens are always left in their cells, and plenty of young brood from which young queens may be reared. In the case of an afterswarm there is a virgin queen, and if the workers don't allow her to destroy all her royal sisters in their cradles she issues with a swarm. If they allow her to kill them, there will be no swarm. In brief, there is never a swarm without a potential successor to the queen.

2. Not half of them are likely to be purely mated.

3. You seem to class three-banded as separate from leather-colored. Pure leather-colored Italians are three-banded, and three-banded may or may not be leather-colored. As a rule I should prefer leather-colored three-banded Italians to any others.

Propolis, Supers, Etc.

1. What is it that bees use to stick so tight everything in the hive?

2. When a swarm comes out it is with the old queen. is it old bees that come out, or is it young bees that come out with the old queen?

3. Is it a good plan to put on hive supers with full sheet foundation soon after new swarm is put in hive?

4. Is it much trouble to use bee escapes?, and will all the bees go down from super into brood chambers, as it is claimed they do?

5. How much is saved in the way of comb-foundation by extracting?

6. If bees were put in a goods box that would hold 10 bushels, would they swarm before they filled the box? and would there be more than one queen in it about the time it was full?

7. Is the honey in brood-chamber over super full of honey enough for the bees in a colony to winter on?

8. Do the bees in the super winter in the super, or do they all go into brood-chamber to winter? TEXAS.

ANSWERS.—1. It is propolis, or bee-glue, mostly gathered from trees, but also from old hives in which there are no bees.

2. The bees of a swarm are of all ages, from the oldest to those that are barely able to fly.

3. Unless an excluder is used, no super should be given until the queen has made a start at laying in the brood-chamber, lest the queen begin laying in the super.

4. It is no great trouble to use them, but you cannot count on their always getting out all the bees promptly. Yet those who use them are quite generally satisfied with them.

5. Nothing the first year; but after the first year you save all the foundation used in sections.

6. Occasionally they might swarm, but they would have a new queen every two to four years, whether they swarmed or not.

7. Yes, and there might be enough without the super.

8 Generally they winter in the brood-chamber, but some, or even all, may be in the super.

Queen-Cells

On page 189, in the book "One Thousand Answers to Bee Questions, "How to Rear Queens on a Small Scale: "When the colony swarms, hive the swarm on a new stand, leaving the mother colony strong. About a week after the issue of the swarm go to the hive each evening and listen for the piping of the young queen. After you hear her, go the next morning and cut out all the cells." Now, it stops before it tells what to do with the cells that he has cut out. Please tell me how to proceed with the work. Will these queen-cells be found in the mother colony or the swarm that came out? NEBRASKA.

ANSWER.—After the cells are cut out they are generally put in the nuclei, although they may also be used in full colonies. To tell all about rearing queens would exceed the limits of this department and make a book of itself. Indeed, an excellent book has been written on the subject by Frank C. Pellet, which you will do well to get.

The queen-cells will be found in the parent hive.

Foulbrood—Transferring

1. I am sending to you a sample of some comb and brood that I have taken out of a hive. I would like to know if those cells that are sunken are foulbrood. You will notice that some of the brood is good. I bought this swarm at a sale last fall and they were in a common goods box. I have now placed them in a 10-frame hive with full sheets of foundation. The swarm is very small and not much honey; have been feeding all spring. If it is foulbrood, what would you advise to do? If it is not foulbrood, would you advise requeening, and when?

2. I have another swarm in a 10-frame hive that is extra strong. They have a very prolific queen. They have at least one-third of each frame full of brood. I am thinking of taking one or two frames from them with brood and giving to a weak colony, and replacing with full foundation sheets. What I want to know is when I take out the frames of brood, should I leave what bees cluster on the frame and put all in with the weak colony? Or should I brush off the bees and put in only the brood?

3. I have a swarm in an 8-frame hive that I bought. They had no foundation sheets and the combs are not straight with the frames. I am able only to take out one frame. They

have plenty of honey and young brood. But I want to put them in a 10-frame hive with full sheets of foundation. Would you advise putting them on top of a 10-frame and driving all bees below and placing on a queen-excluder, between the two hives? If I do this, could I save the young brood, and how long would it be before I could remove the old hive free from brood? Would you advise some other methods? MISSOURI

ANSWERS.—1. I don't discover any evidence of disease in the samples sent. If at any time you think you have diseased brood, send a sample to Dr. E. F. Phillips, Department of Agriculture, Washington, D. C., and in case there is disease he can tell you about it better than I can. If the queen fails to keep the combs properly filled with brood, it will be well for you to supersede her as soon as convenient, unless the bees beat you to it buy superseding her themselves

2. It will be better to give with the brood the adhering bees, unless the weak colony is so weak that the added bees should outnumber the bees of the weak colony. In that case exchange one of the combs of the weak colony for one containing as much sealed brood as possible, brushing off all bees.

3. Your plan will work all right if you can drive the bees down; but it is easier to drive bees up than down. You might drive the bees up into the desired hive, then place this on the stand and put over it the excluder and old hive. In three weeks all worker-brood should have matured.

Partnership, Etc.

1. A and B go into beekeeping as partners. A does all the work. B furnishes $300 of the $400 capital invested. The stock this spring was 30 colonies of bees 20 empty hives and supplies for this summer's crop. What would you consider a fair part for each?

2. Since A does the work, what part should he have of the coming crop?

3. Do drone laying queens and fertile workers lay only in drone-cells, or may drones be reared from worker-cells?

4. Why do bees sometimes construct hard cups resembling a started queen-cell? I have often seen them when there could have been no impulse of swarming.

5. Are you familiar with a honey plant known as spider plant—or spider weed? What is its value?

6. Is there an association of beekeepers in Virginia- If not, give me the name of some one who could give me information about the forming of such an association. VIRGINIA.

ANSWERS.—1 and 2. One fair way would be for B to have a certain rate of interest on the capital invested, that rate being high enough to cover any risk there might be in the case.

3. Drone-laying queens lay in the same kind of cells as other queens, and the drones they produce in worker-cells are small in size. Laying workers prefer drone-cells, but also lay in worker-cells.

4. I don't know. Maybe they think it a good plan to have a start in case it should be needed.

5. Some years ago it had quite a boom and I planted a patch of it. It is a good honey-plant, but not worth keeping on cultivated ground.

6. I know of none. Perhaps Chas. A. Reese, State Apiarist, Charleston, West Va., can help you out.

Stingless Bees

I want to ask you a question. Is it true they are trying to raise or breed bees without stings and with longer proboscis or suckers, so as to be able to take honey from red clover, etc.? NORTH DAKOTA.

ANSWER.—There are stingless bees, but they will probably never be commercially useful, and I do not believe any serious effort will ever be made to have honeybees without stings.

There is a difference in the length of bees' tongues, and some effort has been made to breed longer tongues. Not much, however, has come of it. To me it appears that the more hopeful field lies in the direction of breeding red clover with shorter tubes, so that the common bee can reach the nectar.

Queen Leaving Hive

The other day I found the queen from one of my colonies out on the grass in front of the hive and another queen I found up under the cover of the winter box. Both colonies seem to be in good condition and quite strong. Could you tell me what would make them come out at this time of the year? MICHIGAN.

ANSWER.—Hard to tell. It is possible that the old queen was superseded and was cast out. There is another possibility. The old queen might have been superseded and more than one queen reared to take her place, and the queens you found were extra young queens; but I do not guarantee either of these guesses.

Uniting—Laying-Workers—Honey Plants

1. Can you unite two weak colonies without fighting?

2. I had a nice, strong colony of bees at the end of March this year, and now they are very weak. I looked into them and there were a lot of eggs in the cells and some cells had two eggs. They have no queen. I don't know whether they swarmed or not. They had no sealed brood. Do you think that they are laying-workers?

3. Have the bees got a special worker-bee that lays the eggs?

4. Do they have to be mated, or how does it come that they only rear drones?

5. I gave them two frames of brood, sealed, and one with eggs. Will they build some queen-cells out of the brood if they have no queen?

6. I also gave them a lot of bees out of the hive from which I had taken the brood. Do you think they will stay and help build up the colony, or do you think that it would be advisable to unite them with some other weak colony?

7. I have only 35 colonies of bees and there are only two weak colonies in it; all the rest are very strong. I got 25 18-frame hives and got some supers on some of them; robbed them the first of May. Don't you think that is pretty early for this year?

8. How does it come that they don't class the saw palmetto as a honey-plant? Is not that the main flower down South for producing nectar? They did not mention it in the last Journal on Southern honey-plants.

9. I have a strong colony that is always fighting. I think that there are robber bees that try to get in, but they are killed. This goes on day after day. How can a fellow stop them? I did not expose any honey or anything sweet about. The colony is just loaded with brood. They mave a fine queen and quite a lot of stores, but not enough to take any out. Some colonies averaged 50 pounds surplus so far this season; mostly palmetto honey. FLORIDA.

ANSWERS.—1. Yes, by taking proper precautions. One way is to put a sheet of common newspaper over the top-bars of one hive and set the other hive on it. The bees will gnaw away the paper and gradually unite withiut fighting.

2.It looks very much like a case of laying workers.

3. No. A lot of workers are engaged in the miserable business.

4. No, there is no mating. All drones are reared from unfertilized eggs, whether the eggs be laid by a queen or a worker.

5. They may and they may not.

6. The older bees that you gave them will return to their old place; the younger bees will stay. The probability is that it should be better to unite them with another colony having a good queen.

7. Likely; but I do not know much about it.

8. The palmettos were described at length in the December number of this journal. They are good honey-plants.

9. I do not know. It hardly looks as if robbers would try day after day to enter a strong colony. It looks rather suspiciously like a case of paralysis.

Queen Breeding, Frames, Etc.

1. When running for extracted honey and using a story and a half brood-chamber, would it not be a good idea to have the top story of the 10-frame size and the bottoms half-story and the bottom-board of the 8-frame size? Would the side ventilation be too great?

2. Would you advise commercial queen-raising to one who has a great desire for it?

3. Which do you use in sections, thin or extra thin super foundation, and which is the best for brood-frames?

4. What is royal jelly composed of? Is there any substitute for it?

5. Do you think a 13-frame Jumbo hive too large a brood-chamber for a Dixie beekeeper?

6. Do you keep any bees now, and could you supply one with a breeding queen now?

7. Do you know of a breeder who breeds your stock for sale? VIRGINIA.

ANSWERS.—1. The ventilation will be none too great in hot weather, but would be too great early in the season. You can, however, remedy this by tacking on strips under the 10-frame body.

2. A little hard to tell; but the "great desire" would certainly be a helpful factor.

3. Thin super and medium brood.

4. The bees prepare royal jelly the same as the jelly first fed to all young larvæ, from honey and pollen. There is no substitute for it.

5. Probably not.

6 and 7. I keep bees now, but sell no queens. You can get Miller queens from the Penn Co., Penn, Miss.

Clipping, Swarm Prevention, Etc.

1. Does clipping the queen's wing prevent swarming?

2. If I have two hives containing Italian queens, how can I Italianize my apiary from them next spring?

3. On hot days, is it advisable to raise the top for ventilation?

4. How do you prevent swarming?

5. Suppose I have 8-frame hives. I will take two frames of brood and bees out of each of the first four, then move No. 5 to another stand and put my newly-made swarm in its place. Will my new swarm be strong enough and will it weaken the others enough to prevent swarming? TEXAS.

ANSWERS.—1. No. It prevents the queen going off with a swarm, but does not in the least prevent swarming.

2. One way is to rear queens from them and with these to supersede objectionable queens. Another way may suit you; when the colony with the Italian queen swarms, put the swarm on the old stand and put the Italian colony in place of one of the dark colonies. In a week or so the Italian colony will swarm again, when you will put the swarm in its place and put the Italian colony in place of another dark colony. Do this as often as it swarms, each time putting the Italian colony in place of a dark colony and setting the dark colony in a new place. In this way each swarm will have an Italian queen.

3. It will do good, but it is rather too much work to change the ventilation at each change of weather. Better provide abundant ventilation permanently.

4. It would be a long story to give all the ways which you will find given in my book, "Fifty Years Among the Bees." Perhaps I might say that most frequently it consists in leaving the colony ten days without any egg-laying.

5.Your new swarm should be good, but unless you take away nearly all the brood from them it will not prevent them from swarming.

Scorched Honey

1. A lot of my bees died this winter and last winter, two years. I have fed some honey from a sun capping melter; it is dark and not

fit for sale, and I am now blaming that for killing them in the cellar. Some of the hives are spotted. I ask your advice.

2. I have granulated combs from dead hives. Will bees clean them up when I put them in light hives, when I take them out of the cellar in the spring? Tell me what is best to do with them? Should I melt them up with water for fall feed? ONTARIO.

ANSWERS.—1. It is possible that your bees had diarrhoea without the honey being to blame. But scorched honey is death to bees in winter, and it is possible that was overheated in the melter.

2. The bees will clean them up more or less thoroughly, and it will help them if you occasionally spray the combs with water.

Diseased Brood—Dead Bees

1. After going through my bees I found some diseased brood that has got me "up a tree." Out of my 45 hives I found about 4 that had it. It is not American foulbrood, and I don't think it is European foulbrood, for the reason that it kills but few larvæ in each hive. The dead larvæ lie lengthwise in the cells in a melted form. There is no roping; the color of the larva is light, with a black speck on its head. I was talking to a beeman who keeps about 1,000 hives and he thought from my description it was the so-called "pickle brood."

2. I have a few supers that have been over hives that had mild cases of American foulbrood. The combs have never been used for brood and they are clean of all honey. I was told by an experienced beeman that they ought to be safe to use. What do you think?

3. Do you think I can get as good queens here in California as I can in the east?

4. I noticed an unusual amount of dead bees in front of one of my hives this spring. What causes this? I also noticed a few hives that had taken fully-developed brood out of the cells and dropped it in front of the hives. What causes this? Do you think it was chilled while being examined a few days before? CALIFORNIA.

ANSWERS.—1. Send a sample of the brood to Dr. E. F Phillips, Department of Agriculture, Washington, D. C., and he will inform you as to the trouble and the remedy. If you write to him in advance he will send you, without charge, a box in which to send the brood and also a frank with which to pay the postage.

2. They are probably entirely safe to use again for surplus, with not one chance in a thousand of any danger

3. I don't know any reason why a queen reared in California should not be as good as one reared elsewhere, if reared from the same stock.

4. I don't know why the unusual number of dead bees. The dead brood carried out might have been from chilling; it might have been from starvation; it might have been the work of the wax-worm, or it might have been drone-brood that the bees did not wish matured.

Big Cover—Winter Killing

1. I would like to know what the advantages are of the large cover that the Dadants use on their hives, and why would not a super do just as well for winter packing?

2. Will you tell me some reasons for a colony of bees winter-killing when they were in a good hive and were all O. K. last fall with plenty of bees and stores, and considering such a mild winter. ILLINOIS.

ANSWERS.—1. One advantage is that the cover is larger than a super, and so allows the hive to be covered more warmly. Possibly another reason is that in the first place all covers were of the telescope order, and there never has seemed sufficient reason for making a change.

2. The mild winter may possibly have killed them. You say they had plenty of stores in the fall, but don't say how it was in the spring. The unusually mild winter may have made them fly more than usual, thus using up all their stores. They may have been queenless. They may have had dysentery. There might have been some other trouble.

Bottom Starters—Dandelions

1. In using a 1-inch starter at the bottom of the brood-frame, how much space should be left between the starter and the upper sheet to allow for stretching in order to secure full frames? Standard Langstroth frames.

2. Can bees make a living from dandelion? If not, are there any flowers on which they can before fruit bloom? In northwestern Pennsylvania, I mean.

3. Is the common white daisy a honey-plant?

4. In putting a 4-frame nucleus in a 10-frame hive using six full sheets, is it necessary to use a dummy and increase it gradually? If so, why? PENNSYLVANIA.

ANSWERS.—1. Anywhere from one-eighth to one-fourth inch. But an inch bottom-starter will topple over unless supported, and a much smaller starter is in danger of being torn down by the bees, unless in an upper story.

2. Yes, dandelions are plentiful enough in many places to afford bees a good living during their season.

3. I don't know. I think not.

4. It is not necessary; but it may be a help by saving the heat

Moving Bees

Will you kindly state in the American Bee Journal the various times in the year, in the order of preference, for moving bees by railroad 200 to 300 miles? PENNSYLVANIA.

ANSWER.—Likely the best time is early in the spring, before the combs have become heavy with brood and honey. From that the time will constantly become more objectionable until the middle of the harvest. Better than some of these days, probably, is the time when brood-rearing ceases in the latter part of the season, but not too late for a flight after the journey. To put all these different times in the exact order or their preference is a thing for which I am hardly competent.

Foulbrood

1. Will it cure foulbrood to put the old brood-nest over a clean hive with a bee-escape in between?

2. Can a man who claims he never heard of foulbrood, and has a colony that he never looks in himself, be made to clean it up?

3. Would I be safe in buying hives that bees died in three years ago, of foulbrood, if I boil them out good? I am speaking of American foulbrood. WISCONSIN.

ANSWERS.—1. It might in some cases of European.

2. Yes, in those States where the law requires it.

3. Some very good authorities think it entirely safe.

Purity—Cross Bees—Entrances

1. I have considerable trouble trying to ascertain whether or not my bees are pure. I notice that some of them are golden color and some below the three-bands are very black. Is it possible for bees to have three distinct bands and yet not be pure? Can you state what is an infallible mark of purity?

2. Occasionally my bees become very cross, to the extent even, that I cannot walk out among the hives without having several of them chase me about and even follow me some distance away. At other times they will be very docile, even allowing me to handle them without smoke. What do you suppose is the cause of this difference in their temper?

3. I am giving my bees as much space at the entrance as possible, having taken away the entire entrance blocks and leaving a space all the way across the hive of about an inch. Is this too much space at the entrance? Could this large space have anything to do with their being cross at times? Would this big entrance help to start robbing while a heavy honeyflow is on? ALABAMA.

ANSWERS.—1. Yes, a worker-bee may have three bands and yet not be pure. A colony of mixed blood may have some workers with three bands and some with less, and in such a colony I suppose the worker with three bands is of no purer blood than one with less. But if all the workers of a colony have three bands, the colony is counted pure blood. Yet in a colony of pure blood you may find impure workers that have entered from other colonies.

2. Bees that are busily storing a heavy flow are on their best behavior, and a sudden stop in the flow may make them cross.

3. My bees have an entrance two inches deep the whole width of the hive, and it seems none too much. I don't believe it has anything to do with their being cross, nor would it start robbing in a heavy flow.

Equalizing Brood

Have you ever changed your mind as to the advisability of taking brood from the stronger and giving to the weaker, to equalize colonies in spring? Is it not well to break up the weaker altogether by giving their brood and bees to the stronger and making increase later, where valuable queens would not be discarded? WISCONSIN.

ANSWER.—Up to the present I have never had occasion to change my mind on the subject, nor to have any sort of question about it. But when a man of your experience raises the question it is time to give the whole matter at least thoughtful consideration, whether I change my mind or not. So I have given a pretty good think to it. Especially I have thought over the hundreds of cases in my own experience through many years, and I cannot recall a single case in which I thought the plan was not a good working plan, always having regard to certain restrictions, especially not to reduce any strong colony to less than four broods, and to help first the strongest of those needing help.

Of course, I can imagine a case in which it would not be advisable to try to bring up all the colonies in the apiary to good working order. If in an apiary of 50 colonies there was only one strong colony and the rest were the flimsiest of weaklings, equalizing the whole would only result in failure to get any crop at all; whereas a small number might be made to yield at least some surplus. The others might be doubled up to save the bother of fussing with them. (Even then, if they are dwindlers, as G. M. Doolittle has pointed out, the doubled-up dwindlers will be dwindlers still.)

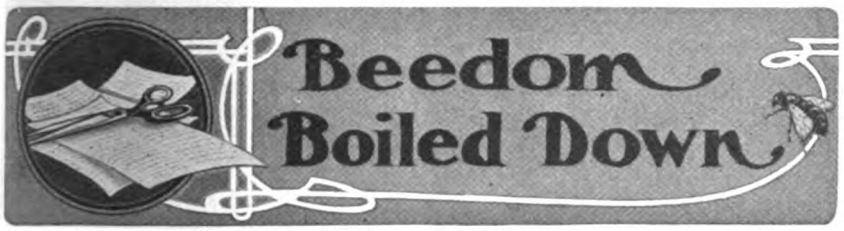
But such a case is so much out of the common as not to be fairly considered. Suppose we have two colonies, one with 3 and the other with 5 brood. Left to itself the weaker one will make very slow progress; but if a frame of brood be given to it from the stronger it will be in condition to walk right along increasing in numbers, and the benefit to the weaker will overbalance the harm done to the stronger. Suppose 5 of the 50 colonies in an apiary are weak. It would simplify matters to unite these 5 with stronger colonies and get them out of the way. But if we let them alone till all the others are made strong ,we can then, at a very little expense to any of the stronger colonies bring up the 5 into serviceable condition, and get a little larger total crop than if we had doubled up the weaklings. At any rate this plan has worked out so well for me that as yet I see no good reason for changing it; yet it is not always wise to be too positive.

To Cement Paper on Metal

Dissolve dextrine in warm water; take 20 parts of glycerine, 10 parts of glucose. Apply this mixture to your paper, then rub metal well with a piece of an onion, then apply to metal.

This is an old recipe, but I have never tried it. Let the readers of the American Bee Journal try it and report results.

BRO. ALPHONSE VEITH, O. S. B.,
St. Meinrad, Ind.



Introduction of Virgin Queens

By J. F. Diemer

THE introduction of virgin queens is a hard nut for many beekeepers to crack, probably because it is not practiced to any great extent. The oftener one does a certain kind of work, the more efficient he becomes.

Introducing queen-cells is very much easier, but even then it is necessary to take a look-in, to see whether she is hatched, whether she has all the limbs that belong to a perfect queen, for she may have imperfect wings, and in that case would only be a drone-layer. Also the careless handling of the queen-cell may kill the young queen in it.

If they are allowed to hatch in the nursery cage, the poor ones may be sorted out and only the good ones used.

The nursery cage which I use is so arranged that the bees have free access to the queen-cells at all times. The cages are made of woven wire. At the bottom is an opening, made from a queen-excluder fastened to the wooden plug that closes the lower end of the cage. When removing the cage, a slight turn closes the hole, confining the bees in the cage, 10 to 20 of them, with the queen. These are introduced with the young queen and, I believe, help the safe introduction of her majesty.

Five different conditions may exist in the queenless nuclei or colonies where a young queen is to be introduced, as follows:

No. 1. Bees only.

No. 2. Bees and eggs only.

No. 3. Bees, sealed brood and queen-cells.

No. 4. Bees, eggs, unsealed brood and sealed brood.

No. 5. Bees, eggs and unsealed brood only.

The time the queen is to be confined in the cage is regulated by the amount of candy in the tube. The tube I use is 2 inches long and one-half inch in diameter, and if it is full, it takes the bees 48 hours to eat it up and release the queen.

In introducing a queen to Nos. 1, 2 and 3, I take all the candy out except a small amount, because it is easy to get these colonies to accept a queen. Time is 4 to 6 hours.

The queen-cells should be removed from No. 3.

No. 4 is all right after 48 hours. No. 5 is the hardest to deal with, especially if it has 3 or 4 frames of brood, and the bees are old and crabbed. If their brood is removed and sealed brood only given them, they will accept a virgin in 48 hours.

If introducing either a virgin or a laying queen, it is very important that there be no robbing, or excitement. I lose very few virgins, because I do not try to introduce them when there is the least excitement.

It is not best to try to introduce old virgins, as they are too anxious to leave the hive for their wedding flight.

Liberty, Mo.

How Exports Affect the Honey Market

Adequate Packing a Necessity—A Prospectus of Honey Prices

"FOREIGN importers will no longer tolerate any such packages as have been shipped in the last two years, as the loss of honey packed in cans and cases has been tremendous, especially so on goods shipped early in the season, when the honey was liquid."

This is the statement of one of the leading export commission merchants of New York City. Criticising our American methods of packing honey, he continues: "We are sufficiently experienced in this line to know that radical changes must be made in the packing of American honey for exportation. If the business is to be promoted, the present packing of honey for export is absolutely unsatisfactory."

In view of the fact that many authorities agree that exportation of honey is keeping up the present high prices, more so than domestic demand, this advice from so high an authority is pertinent. The commission merchant mentioned estimates that not one single importer in Italy made a profit on the importation of American honey, in spite of the fact that all this honey arrived in Italy on a strong advancing market. The loss in revenue was due to the loss in transit, this in turn being the result of improper packing.

This same authority advises that second-hand cans and cases should not be used for export. He advises everyone to pack American honey in cans and cases for export so that foreign countries will want to buy here always, instead of only when they have to. The placing of corrugated paper in the bottom of cases as well as at the sides is advised. It is estimated that the ends and center partition of all honey cases intended for export should be made of not less than seven-eighths-inch lumber, and the top and bottom of not less than seven-sixteenths-inch lumber. On all cases the use of iron straps and the nailing of these straps is advised. This makes a substantial package. It can be easily opened, as it is necessary for exporters at the seaboard to sample 10 per cent of all such honey.

An importer in London advances the information that 6,000 tons of honey held in Australia for lack of freight room is now coming on the London market. He advises that England will give preference to buying from her own colonies, especially with freight conditions becoming normal.

Reliable information indicates that towns on the coast and most large producers have cleaned up on last year's honey crop. However, a number of wholesale grocers throughout the country have on hand from one to two carloads of honey purchased last October in anticipation of a sugar shortage. These factors will have a vital bearing on the demand and price of honey next fall. They may well be considered by every commercial producer of honey in the United States.

Certificates for Beekeepers

I have read with interest the work of the bee clubs and what they are doing for our young people. In the bee club the prize goes to the one who produces the greatest surplus, while there may be a better beekeeper, in a worse location, who can never aspire to the first rank. There is a system in vogue in Ireland that meets with great success, and that is of granting certificates of competency after an examination, to those who can pass the tests. There are two grades, the higher being the experts.

I would suggest that the American Bee Journal issue certificates having set tests for the two grades, and appointing reliable "experts" to see the tests carried out. There would also be a written test to see if the student knows the underlying principles of the art.

A good test for the lower grade would be the transfer from box or skep to hive in one operation, and for the written part questions dealing with age of queen, drone and worker at different stages of their development.

The examination for the higher certificate would be much stiffer, going into bee diseases, etc. One test I know was to take three queens from three hives and then replace them without having let go of them at all during the operation; one queen had to be held in the lips to successfully get through this test.

However, the main object was to get every beekeeper striving first for ordinary proficiency, and later on he or she is sure to want to be an expert.

This system can be made to reach all, while only the favored few can attend the college courses and get the instruction so badly needed to stamp out foulbrood. Again, anyone who has bees and cannot, or will not, mind them can thus get some one who, they know, is capable to look after them, either for pay or on shares.

Beekeeping is very much like what

the Irishman said about drinking whisky, "not so much an education as it is a gift."

North Lonsdale, B. C.

Microscopical Studies

IN the American Bee Journal for February, 1919, Dr. Brunnich, of Reuchenette, Switzerland, offers an interesting explanation for the **rectal glands of Chun,** both regarding construction and function. Their historical features permitted him to conclude that they are possibly concerned with the excretion from the blood of excessive water absorbed through the lining membrane of the honey sac from the nectar gathered, and that they appear to be capable of double filtration. Developing this idea, one may consider them, so to speak, the "kidneys" of the bee, which indirectly help in concentrating the nectar during its transformation into honey, and directly aid in "washing" the blood. Supposing this explanation is correct, it would be feasible to presume also that an additional benefit from the dilution of the blood is to raise its pressure, and thus help the bee to carry her load to the hive, since a higher blood pressure would presumably aid the bees in her heavy flight. Following this line of argument, it is feasible again to suspect that probably some irritation, or lesion of these glands occurs in the pathological **diarrhoea** of bees, and that by excessive secretion of fluid the blood pressure is abnormally lowered, indirectly causing disability of flight. The apparent **dislocation of the wings** might be either accidental, from fruitless attempts at flight, apart from being a sign of debility in old bees which are not otherwise diseased, or might be the result of loss of muscular tone, and partial nerve paralysis, resulting from metabolic toxaemia. The same theory of blood pressure which I suggest would hold equally well with normal, but chilled bees that are unable to fly. Since the blood pressure is dependent on the rates of the heart beat and respiration, apart from the volume of the blood, and since the rapidity of these rates is governed by temperature, it follows that the blood pressure of a chilled bee is bound to be low. This theory is further capable of explaining certain phenomena which I shall incorporate in my "Notes on 'Isle of Wight' Disease" in the British Bee Journal.—A. Z. Abushady, in British Bee Journal.

Paste for Tin

We have tried many things to make a paste that would always stick on tin. Here it is. This was given to us by a traveling man for the Standard Oil Co., who told us it is what they use, and you know their labels stick. The proportions as given here are for small quantities; you may use more starch to make the paste thicker, but this is about what we find right for general use:

Take two heaping teaspoons of corn starch and dissolve in a small amount of cold water. In another vessel dissolve one teaspoon of Lewis lye, or any good concentrated lye, mix with the dissolved corn starch. If this makes the starch too strong of lye, it can be reduced, but if too little is used the label will not stick to the tin. If too strong, it may turn the label yellow. When thoroughly mixed the paste is ready for use. Apply paste to back of labels with a brush or cloth. If labels wrinkle when putting them on, wet both sides with water, so they are thoroughly dampened, before applying the paste. This is a good paste for anything to which paper is to be attached.

J. R. SANDERSON.

Yellow Jackets

In the March number of the Bee Journal someone in the State of Washington expresses a "wish to learn some way to help the bees to handle yellow jackets." Dr. Miller's advice is excellent, but, unfortunately, we cannot always keep every colony strong, and it is very difficult to find all yellow jackets nests.

Two years ago we had a scourge of yellow jackets in this locality and some lost whole colonies of bees. Last year we had comparatively few. I heard of no one finding and destroying the nests. Following is the plan adopted by some of us very succesfully:

Get fly traps, the kind made of wire netting, where the insects enter at the bottom and cannot get out because they fly upward, where there is no escape. Get a large one—they are made a foot and more high. Put a bit of meat or fish in the trap and set it out and the yellow jackets will flock to it. When it is full of yellow jackets, put it in boiling water, empty it and reset it. One person told me she had to empty hers twice, and even three times a day, and it was a large trap.

EMILY D. SMITH,
Los Gatos, Cal.

Inspection in Michigan

Two acts, which are of interest to Michigan beekeepers in particular, have been passed by the recent Legislature. One makes certain changes in the law relative to quarantining of diseased districts and the other being an appropriation of $10,160 for carrying on the work of the office of the State Inspector of Apiaries.

The appropriation bill was passed as a budget bill and specifies that the State Inspector and Chief Deputy shall serve throughout the year. Other deputies are to be used only during a part of the spring and summer. The corps of men have already been selected for the work and will begin their duties on July 1. It is unusual for an inspector to exercise any of the authority which has been conferred upon him. When authority is needed, he has all that is necessary. It is the understanding of all inspectors that their duties are to be beneficial to every beekeeper with whom they come in contact, to encourage better methods of beekeeping, to encourage intelligent beekeepers to increase their number of colonies, to stimulate local organizations and field meetings, and in general to do everything in their power to help build up the industry. When law enforcement is the obvious duty, then the law is enforced without the assistance of constable, sheriff or any other officer who doesn't know a bee from a yellow jacket. We are now enforcing the law against box hives and other nuisances in which bees are sometimes kept.

During the coming year we will have several short courses given jointly by the College and the office of the State Inspector. County beekeepers' schools will be continued, and within the year every county having a beekeeping industry will be visited. Publications will be continued, and it is hoped to enlarge somewhat upon the Beekeepers' Letter. We shall continue to co-operate with the State Beekeepers' Association, for it has shown itself to be a power for good among Michigan beekeepers. The distribution of Italian queens for the control of European foulbrood will be tried out in a small way this summer. Field meetings and demonstrations started in May and will continue all summer. Appeals for individual help with disease will be cared for as heretofore. Our present law is broad enough so that it is possible to cover any activity which is really beneficial to the industry.

B. F. KINDIG.

Queen Lost in Mating Trip

In the answer given by Dr. Miller, on page 238, on the above subject, to the second enquirer, the doctor probably misunderstood the question, for there are numerous instances in which the bees have no resources left in the matter of brood or young queens, when the virgin queen is lost in her mating flight. The first queen hatched usually destroys the others, unless the colony wishes to swarm again, when the bees prevent her from doing so.

The only remedy to apply when the queen gets lost in her wedding flight is a new queen or a queen-cell ready to hatch. Every queen breeder watches closely the colonies that have queens to be fertilized.

New York Field Meets

A field meet of the Western New York Honey Producers' Association is to be held July 26, at the home apiary of Adams & Myers, Ransomville, N. Y. Another meet, of the New York State Association of Beekeepers' Societies, will be held August 1, at the home apiary of Deroy Taylor, Newark, N. Y. If it is possible for some one of the American Bee Journal staff to be present, he will attend both of these meets.

Southern Queen Breeders Swamped

The queen-breeders of the South probably never had as busy a season as this. The weather has been extremely unfavorable for shipping bees, on account of numerous rains.

Yellow Jasmine

Your editorial in the May Journal on "Does the Yellow Jasmine Poison Bees?" just read. In regard to same shall say that this is my first season near the Atlantic coast of North Carolina, where the yellow jasmine is found abundantly, in fact for three weeks it was our only source of nectar during April. The last blossoms are now disappearing. Mr. F. S. Johnson, of Mt. Airy, N. C., was with me lately and we noticed many bees dying in front of the hives, many being young bees. I had noticed bees dying similarly in the Piedmont section in former years, with the difference that formerly it seemed to affect old bees. The disease, or trouble, has about disappeared. I think at one time enough bees died to seriously affect the strength of a colony. Jasmine honey is amber colored and is yielded in quantities to aid brood-rearing largely.

The spring here has been very backward, with killing frosts on April 26. Flowers yielded no honey for a week or more after it.

We are now in a great flow from blackberry and cotton gum (a tupelo), with gallberry about to open. Our winter was very mild and few bees were lost.

Another fact on jasmine honey. I was surprised to find last week that one colony that had much more honey than any other is headed by a hybrid queen, mismated, making her bees almost black. Whether they are immune to the poison, as indicated by Mr. Brown, or this just happened, I can't say. This was a very weak colony earlier in the season.

BRUCE ANDERSON.

Death of Dr. McCray

Just as we are going to press we learn of the death of Dr. A. H. McCray, which occurred Saturday, June 14. Dr. McCray, together with Dr. G. F. White, will be remembered as author of the Department Bulletin "Diagnosis of Bee Diseases by Laboratory Methods. Dr. McCray had lately been director of the Laboratory of Hygiene of the State of Montana and was conducting investigations on the spotted fever. It is believed he contracted this disease during his studies. Particulars will follow in our August number.

A Drone-layer

Finding a queenless colony in which a drone-layer had developed, I wanted a quick, easy and certain way to separate the bees from the criminal, so proceeded as follows:

On a piece of board which effectually closed the entrance of the hive I put a small wire bee-escape, open-out; then from another hive took a frame of brood and put it into a hive with three other frames and a tight division-board and set the hive with a 3-bee entrance almost in contact with the cone bee-escape.

The bees were very active, carrying in pollen and feed, and not being able to get into the parent hive naturally went into the other, and finding brood, proceeded to start a queen-cell.

I assumed that the drone-layer, like a laying queen, would remain on the combs, at any rate until the bees were about all gone, which proved to be the case. The next thing was to pick out half a dozen drones, put them in with the bees in the new hive, then a little formaldehyde finished the drone-layer and drones.

DR. BONNEY.

Beekeepers' Chautauqua is First of Its Kind

The beekeepers' chautauqua is a new departure in the way of summer celebrations. But that is the plan of the Wisconsin Beekeepers' Association for August 25-30 this year. The chautauqua will be held on the old Lake Monona assembly grounds at Madison, announces H. F. Wilson, secretary of the beekeepers' organization.

Although the social side of the meeting will be emphasized, the plans include a series of lectures by men well known in the beekeeping world. The speakers who have already agreed to talk to the Wisconsin fraternity are E. F. Phillips, in charge of beekeeping work for the U. S. Department of Agriculture, and G. S. Demuth, his assistant.

New York Meet at Newark, N. Y.

The program of the State meeting is not yet ready, but the following people expect to be with us at Newark August 1:

E. R. Root, L. C. Dadant, Dr. Phillips and Kenneth Hawkins, all very prominent men in the beekeeping world.

Special attention is going to be given to the problem of creating a demand for honey. Come and prepare to give this problem your best support. Everyone is welcome. Basket lunch at noon.

Program with directions of how to reach our place will be mailed on request, either by Deroy Taylor, O. L. Hershiser, Kenmore, N. Y., or J. H. Cunningham, 303 University Place, Syracuse, N. Y.

There will be several demonstrations there on that day that will be bound to interest you. Come and bring your friends.

J. H. CUNNINGHAM, Secy.

BEE-KEEPING FOR WOMEN

Conducted by Miss Emma M. Wilson, Marengo, Ill.

Giving a Queen

After the first swarm has issued, can you give the parent colony a laying queen successfully? If so, what method would you recommend to introduce her?

Washington.

Answer.—When the first swarm issues the old queen goes with it, leaving a number of queen-cells. If you wait a week or more (but not waiting till the first virgin emerges from her cell), and then kill all the queen-cells, there will be left nothing from which a queen can be reared, and that will have a tendency to make the bees ready to accept a queen. But there are other things to be considered. When the swarm issued, a large part of them were old bees, leaving mostly young bees in the old hive. If you wait a week before introducing, the bees will be a week older, and hence a larger proportion of older bees, and it is the older bees that raise the mischief when a new queen is introduced. Besides that, waiting a week before introducing the queen will be the loss of a week in the rearing of brood, which may be a matter of considerable importance.

So, taking all into consideration, it is better to proceed as soon as convenient after the prime swarm has issued to introduce the new queen. Destroy all queen-cells, whether sealed or unsealed, even those containing only eggs. If you have bought a new queen for introduction, directions as to how to proceed will no doubt accompany her, which directions you will do well to follow.

It may be, however, that you have reared a queen in a nucleus, and want to use her for introduction. Use one of the introducing-cages that are in common use. Use a long, slender nail to pin the cage on the comb, putting it in the central part of the hive, surrounded by brood, where there is no danger that the queen will be deserted by the bees and chilled.

The cage is provisioned with queen candy, and the construction of the cage is such that it will take a day—perhaps two or three days—for the bees to eat away the cardboard that covers the candy, then eat the candy and release the queen.

If you haven't a regular introducing cage, you can make a cage that will answer. What are called "one-cent cages," because the material costs only a cent, are thus described in Dr. Miller's book, "Fifty Years Among the Bees":

"I take a pine block, 5x1x⅛ in., and wrap around it a piece of wire-cloth 4 inches square. The wire-cloth is allowed to project at one end of the block a half inch. The four sides of this projecting end are bent down upon the end of the stick and hammered down tight into place. A piece of fine wire about 10 inches long is wrapped around the wire-cloth, about an inch from the open end, which will be about the middle of the stick, and the ends of the wire are twisted together. I then pull out the block, trim off the corners of the end a little, so that it will easily enter the cage, slide the stick in and out of the cage a number of times, so that it

will work easily, and the thing is complete. When not in use, the block is pushed clear in, so as to preserve the shape of the cage. As the bees cannot release the queen in a cage of this kind, it will be necessary for you to release her yourself at the end of perhaps three days.

If the queen to be introduced is from a nucleus in your own yard, you may like still better, instead of putting the queen in a cage, to put the nucleus, queen and all, into the queenless colony.

Selecting a Breeding Queen

She who would make a real success with her bees will do well to take for her own the slogan, "Breed from the best." Even if but a little be done in that direction, the results may be quite important. If only one colony in twenty be very poor, replacing the queen of that one colony with a queen reared from the best will make more difference in succeeding crops than might be supposed. If it should double the harvest of that one colony the effort would seem well worth while; but it may make still more difference in another direction, for the drone descendants of that poor queen may cause a slump in the yield of more than one colony a year or two later.

If you do nothing more than to replace a few of your poorest queens with others of best parentage, it is time to begin now to take steps toward deciding which is your best queen, as also the second best, third best, and so on. For if you should decide as to which is best, paying no regard to the others, the bees might take it into their heads to supersede that best queen this fall, and then you are out. Please keep in mind that you are keeping tab on your queens this year so as to know what to do next year.

Several things are to be considered in deciding what you will choose for a breeder A queen with very cross bees would be disqualified. So would a queen whose workers are not three-banded, if you are working for Italian stock. For a comb-honey producer, a queen whose workers should have sections with watery cappings would not do. Likely you would make a difference as to whether a queen was much or little given to swarming.

However it may be about other items, one thing you must keep track of, and that is the the amount of honey stored by each colony. There must be no guess work about it; each time you take a section or extracting-frame, you must put it down in black and white. One way is to have in your record book one or two vacant lines above the record of each colony, putting there the number of sections or pounds taken.

It is easy to give credit for the number of sections taken. To keep tally for extracted honey is not so easy. One way is to credit a certain number of units for each frame fully filled. You might use any number most convenient for that purpose, say eight. Then you would credit 8 for a full frame, 4 for one half filled, 6 for one three-fourths full, and so on. Perhaps you may devise some method you may like better; only have some way so that you will know how any colony compares with any other in the matter of storing.

If each colony is left to its own devices throughout the season, then these figures are conclusive; a colony having 100 credits is a better storer than one with 90 credits, and that's all there is to it. But if you have practiced equalizing colonies early in the season, taking brood and bees from one colony and giving to another, then the case is different; the one credited with 90 pounds may be a better storer than the 100-pound one. The 90-pound colony may have had taken from it 2, 3 or more frames of brood with adhering bees, thereby bringing down its storing ability, and for this the queen should not be blamed. The 100-pound colony may have had brood given it, increasing its storing capacity, and for this the queen should not have credit.

So these are the two things you must keep track of carefully, the amount of surplus stored by each colony, and also the number of frames of brood and bees taken or given. Then after the season is all over, perhaps some time next winter, you will be ready to make out the comparative standing of each colony, a matter which may be left for future consideration.

QUEENS

By return mail. A choice lot of untested queens for July delivery, bred and selected from the best stock that can be had; single, $1.25; doz., $10.

A. B. MARCHANT
DOCTORTOWN, GA.

CLASSIFIED DEPARTMENT.

Advertisements in this department will be inserted at 15 cents per line, with no discounts of any kind. Notices here cannot be less than two lines. If wanted in this department, you must say so when ordering.

BEES AND QUEENS

ITALIAN QUEENS AND NUCLEI—
Untested queens, $1; tested, $1.50; select tested, $2.50.
1-Frame Nucleus, $2.25; 2-frame, $4.00.
1-lb. package of bees, extra, $2.25; 2-lb. package, $4.00.
A trial order will convince you of their merits. H. A. McCarley, Mathis, Tex.

THE AMERICAN BEE JOURNAL is prepared to furnish printing for beekeepers. High quality, prompt service and satisfaction. Our shop is in charge of a man who specializes in printing for the honey producer. Send for our catalog of honey labels, stationery, etc. American Bee Journal, Hamilton, Ill.

WANTED—A few Carniolan queens.
John Kneser, R 1, Hales Corners, Wis.

FOR SALE—Golden Italian queens, untested, $1 each; tested, $2.
J F. Michael, Winchester, Ind.

FOR SALE—Fine Italian queens, untested, $1 for one; $5.50 for six; tested, $2 for one, $9 for six; tested by return mail, untested ready June 1 to June 10.
R. B. Grout, Jamaica, Vt.

FOR SALE—Leather colored Italian queens, tested, June 1, $1.50; untested, $1.25; $13 a dozen. A. W. Yates,
15 Chapman St., Hartford, Conn.

100 COLONIES in 8-frame hives with one super each, for sale, or would work on halves with good man. Location fine.
Mrs. T. H. Carruth, Big Bend, La.

ITALIAN QUEENS—Northern-bred, three-banded, highest grade, select, untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness and perfect markings. Price, one, $1; twelve, $11; fifty, $45. Send for circular.
J H. Haughey, Berrien Springs, Mich.

FOR SALE—Hardy Italian queens, 1, $1; 10, $8. W. G. Lauver, Middletown, Pa., R. 3.

FOR SALE—Goldens, untested, 1, $1.25; 6, $6.50; 12, $11.50. S. A. Tyler, Emden, Ill.

THREE-BANDED ITALIANS ONLY—Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. H. G. Dunn,
The Willows, San Jose, Calif.

GOLDENS that are true to name. Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. Garden City Apiaries,
San Jose, Calif.

FOR SALE—Bright Italian queens, $1 each; $10 per doz. Ready April 1. Safe arrival guaranteed.
T. J. Talley, R. 4, Greenville, Ala.

Head your colonies with Simmons' Famous Italian Queens. They took first premium at New York State Fair last September. Goldens or three-bands: 1, $1.50; 6, $7.50; 25, $30. Orders booked now and filled in rotation. Also nucleus from same stock ready for June delivery. Allen R Simmons,
Fairmount Apiary, Claverack, N. Y.

J. B. BROCKWELL'S Golden Queens, untested, May, June and July, $2 each; six, $7.50; doz., $14; tested, $4 each. Breeders, $5 to $20 each; 3-f. nuclei with tested queen, $9.
Barnetts, Va.

FOR SALE—3-band Italian queens ready June 1. Untested, each $1; twelve, $10; 100, $80. No disease here and satisfaction guaranteed. A. E. Crandall & Son,
Berlin, Conn.

LEATHER and all dark colored Italian queens, when we have them, mated, $1 each. These queens will include all that are not up to the standard in our goldens, but will be good utility stock. C. W Phelps & Son,
No. 8 Wilcox St. Binghamton, N. Y.

SWARTS GOLDEN QUEENS produce golden bees of the highest quality; satisfaction guaranteed. Mated, $1, 6 for $5; tested, $2.
D L Swarts, Lancaster, O., Rt. 2.

FOR SALE—3-band Italian queens from best honey-gathering strains obtainable. Untested queens, $1.25 each; 6, $6.50; 12, $11. Satisfaction guaranteed. W. T. Perdue,
Route No. 1, Fort Deposit, Ala.

OUR BRIGHT ITALIAN QUEENS will be ready for shipment after April 15. Untested, 75c each; half doz., $4.50, or $8 per doz. Select untested, 90c each; half doz., $5.50, or $10 per doz. Tested, $1.50 each. Safe arrival guaranteed.
Tillery Bros., R. 5, Box 1D, Georgiana, Ala.

FOR SALE—One of the best queen breeders in the United States is now raising queens for us from selected stock of leather-colored Italians. We offer warranted queens at $1 each, or $90 per hundred. Tested queens $2 each. Satisfaction and safe delivery guaranteed. Queens ready now for immediate delivery. Order now, as our supply is limited.
The Foster Honey & Mercantile Co.,
Boulder, Colo.

FOR SALE—Pure 3-banded Italian queens, as good as you can buy with money, from June 1 to September 1.
J. F. Diemer, Liberty, Mo.

BEES AND QUEENS from my New Jersey apiary. J. H. M. Cook,
1Atf 84 Cortland St., New York City.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you desire. They are great honey gatherers, beautiful and gentle. Virgin, $1; mated, $2. C. W. Phelps & Son,
3 Wilcox St., Binghamton, N. Y.

FOR SALE—Three-banded Italian queens; untested queen $1, six, $5.50; twelve, $10. Tested queens $2 each.
Robert B. Spicer, Wharton, N. J.

FOR SALE—Nine 10-frame hives of bees, wired full sheets foundation, $8 each; 25 new hive bodies; almost new 2-frame Cowan extractor. Make me an offer. M. E. B.,
5729 Eichelberger St., St. Louis, Mo.

TEXAS BRED QUEENS—As our bee shipping season is practically over by the first of June, we will have some extra queens to offer at the following reduced prices: Untested, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40. Select untested, 1, $1.50; 6, $7.50; 12, $13.50; 50, $48. Tested, 1, $2; 6, $10.50; 12, 18.50. Select tested, 1, $2.75; 6, $15; 12, $27.

One-pound package of bees, $2.40; 25 or more, $2.16 each. Two-pound package of bees, $4.25, 25 or more, $3.83 each. Three-pound package of bees $6.25, 25 or more $5.62 each. One frame regular nuclei with 1 pound extra bees, $4.50 each. Two-frame regular nuclei with 1 pound extra bees, $6 each. One-frame regular nuclei with 2 pounds extra bees, $6 each. Two-frame regular nuclei with no extra bees, $4.50 each. Three-frame regular nuclei with no extra bees, $6 each. All by express f. o. b. here.

Add the price of queen wanted when ordering bees. Circular free giving details.
Nueces County Apiaries, Calallen, Texas.

EDSON APIARIES increased queen rearing facilities will insure the prompt delivery of A1 laying Italian queens, leather colored or golden. Prices reasonable. Address
Edson Apiaries, West Butte, Cal.

ITALIAN QUEENS of "Windmere" for sale; untested $1, tested $2. Nuclei in limited numbers during July and August.
Prof. W. A. Matheny,
Ohio University, Athens, Ohio.

FOR SALE—Extra fine Dr. C. C. Miller queens, untested $1 each, 6 for $5.50, 12 for $10, 100 for $80. With 400 to draw from I will be filling orders by return mail.
Curd Walker, queen breeder,
Jellico, Tenn., Rt. 1, Box 18.

FOR SALE—Michigan bred Italian queens; am now booking orders for August 1 delivery; 3-band only; untested, 1, $1; 12, $10; 100, $80. Tested, $1.75 each,
D. A. Davis, North Detroit, Mich.

FOR SALE—Full colonies of bees in 10-frame hives with metal covers, at $8.
Frank France, Platteville, Wis.

QUEENS—BEES—Three-band Italians; productive, gentle. For July queens, untested, 75c; five, $3.50. Two-frame nuclei and queen, $4.75. Sunset Farm, Asheboro, N. C.

FOR SALE—Italian queens; select just hatched, 50c; untested, $1. Especially safe introduction plan free. Order in advance.
James McKee, Riverside, Calif.

FOR SALE—I am up with my orders and better prepared for shipping prize-winning queens. My queen was awarded first prize at State Beekeeper's Convention held in Little Rock May 31. Untested, $1; tested, $2.
H. P. Gannaway, R 1, Box 208, Ft. Smith, Ark.

FOR SALE—For spring delivery—Colonies of Italian bees, fine strain, with tested queen, in one-story 8-frame single-wall hives, full depth, self-spaced Hoffman frames, nearly all wired, $10 each. A few colonies in 10-frame hives, $12 each; all free from disease; f. o. b. here.
Wilmer Clarke, Earlville, Mad. Co., N. Y.

PURE ITALIAN QUEENS—Doolittle and Moore choice stock, also goldens that are golden. Every queen mated and laying before being caged. Select untested, $1.50 each. Select tested, $2.50. For large lots write for price. Safe arrival and satisfaction I guarantee.
J. E. Wing, 155 Schiele Ave., San Jose, Cal.

I. F. MILLER'S STRAIN Italian Queen Bees for sale. By return mail or your money back. Northern bred, for business, from my best superior breeders; gentle, roll honey in, hardy, winter well, not inclined to swarm; leather color or 3-banded. Queens a specialty; 25 years' breeding experience. Safe arrival and satisfaction guaranteed. Untested, $1; 6, $5.50; 12, $10. Select untested, $1.25; 6, $6.75; 12, $12.
I. F. Miller, Brookville, Pa., R. R. No. 2.

HONEY AND BEESWAX

FOR SALE—4 60-lb cans choice extracted buckwheat honey, 1 60-lb. can clover and buckwheat mixed, 400 sections fine quality buckwheat honey, about 400 sections fine clover and about 200 sections clover and buckwheat mixed in 4¼x1¼ sections. Will sell the whole lot at 19c, or a part of it for 20c, f. o. b. here. Send cash with order.
Wilmer Clarke, Earlville, Mad. Co., N. Y.

WANTED—To buy 100 to 300 colonies of bees with location, preferably in Michigan. Address 1635 South 25th St., Lincoln, Neb.

WE WANT every subscriber of the American Bee Journal to become a subscriber of the Domestic Beekeeper. Listen: A $5(or more) order of beekeepers' supplies at catalog price bought through the Domestic Beekeeper, Northstar, Mich., and a dollar extra for a year's subscription to the Domestic Beekeeper, will entitle you to a dollar rebate. leaving your subscription to the Domestic Beekeeper absolutely free. Could one ask more? This offer will give one an idea of what the Domestic Beekeeper is doing for its subscribers in the way of buying their supplies.

FOR SALE—Michigan's best extracted honey in packages to suit. White clover, raspberry, milkweed, buckwheat.
A. G. Woodman, Grand Rapids, Mich.

WANTED—Comb, extracted honey and beeswax. R. A. Burnett & Co.,
6A12t 173 S. Water St. Chicago, Ill.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co.,
204 Walnut St., Cincinnati, Ohio.

WANTED—Extracted honey, all kinds and grades, for export purposes. Any quantity. Please send samples and quotations.
M. Betancourt, 59 Pearl St., New York City.

FOR SALE

FOR SALE—500 second-hand 60-lb. honey cans in good condition. John Kneser,
R. 1, Hales Corners, Wis.

FOR SALE—Clover and buckwheat honey in any style container (glass or tin). Let us quote you. The Deroy Taylor Co.,
Newark, N. Y.

FOR SALE—Frame nailing device. You can make very satisfactory and simple device. Send 50c for drawings showing construction and operation for nailing Hoffman frames; use idea for nailing any style of frame.
Clarence Aldrich, Santa Barbara, Calif.

FOR SALE—Cedar or pine dove-tailed hives; also full line of supplies, including Dadant's foundation. Write for catalog.
A. E. Burdick, Sunnyside, Wash

FOR SALE—40,000 pounds of No. 1 extracted clover honey and 35,000 pounds of aster honey; both of extra light color, heavy body and fine flavor, in 60-lb. cans.
W. B. Wallin, Brooksville, Ky.

FOR SALE—25 10-frame hives, never been used, full sheets foundation.
80 lbs. foundation brood and surplus.
15 feeders.
70 10-frame queen excluders.
100 comb supers, 10-frame.
2,500 sections, 4¼x4¼x1⅞.
Five to six hundred extracting supers, with combs; no disease. E. Keister, Clarno, Wis.

FOR SALE—Silver Spangled Hamburg eggs and fine, rare old Paganini violin for sale.
Elias Fox, Union Center, Wis.

FOR SALE—Photos of L. L. Langstroth, inventor of movable-frame hives, size 7x9; price, $1. American Bee Journal,
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FOR SALE—A limited number of bees and queens for May delivery from either home apiaries or South Carolina; safe delivery guaranteed if shipped by express. Parcels post shipments at buyer's risk. We invite correspondence as to details and price.
The Deroy Taylor Co., Newark, N. Y.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
Superior Honey Co., Ogden, Utah.

SPECIAL SALE—1-story 8-frame dovetailed hives in flat, with telescope ⅛ wood covers, in packages of 5, at $10 per package.
A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—One hundred and seventy-one 1-frame nuclei shipping cages; twenty-five 10-frame G. B. Lewis beehives; one hundred comb- honey supers; one hundred eight-frame bottom-boards and covers; fifteen pounds of medium brood; fifteen pounds extra thin Dadant foundation; about two hundred Hoffman Brood-frames.
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FOR SALE—50 supers at half price; have more than I need. Mrs. Anna Josephson,
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WM. A. RAFAEL, former manager for the A. I Root Company at San Francisco, has established a beekeepers' supply business together with Mr. J. E.. Wing, queen breeder, in the Southern Pacific Building, No. 16 Steuart St., San Francisco. Rafael & Wing.

WANTED

WANTED—Your old combs, cappings or slumgum to render into beeswax by our high steam pressure wax presses.
Dadant & Sons, Hamilton, Ill.

WANTED—July, 1916, June, July and December, 1917, and January and March, 1918 numbers of the American Bee Journal; will pay 10 cents per copy. Please wrap so that the whole Journal is protected.
American Bee Journal, Hamilton, Ill.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices.
Superior Honey Co., Ogden, Utah.

WANTED—Second-hand 10-inch foundation machine, 5 cells to the inch; must be in good condition. Write giving full particulars as to date bought, size rolls, general condition and price (lowest) to Jsidoro A Baldrich,
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WANTED—Man with some experience to work with bees coming season; state age, experience and wages; we furnish board. The Rocky Mountain Bee Co., Billings, Mont., Box 1319.

MISCELLANEOUS

E. D. TOWNSEND, the present owner of the Domestic Beekeeper, bought beekeepers' supplies for the National Beekeepers' Association for several years. He is now buying for the subscribers of the Domestic Beekeeper at the same low manufacturers' price. Listen now what he has got up his sleeve: Any American Bee Journal subscriber buying $5 worth of supplies through the Domestic Beekeeper at catalog price, and sending along an extra dollar to pay for a year's subscription to the Domestic Beekeeper, will get in return a rebate check of $1, leaving the year's subscription to the Domestic Beekeeper absolutely free to you. Of course, if your order for supplies is larger than $5 you will have a correspondingly larger rebate check on your order. One of our subscribers got a rebate check on his order of supplies last month, March, of $40. It was just like getting money from home to him, as he sent us the same money he would have had to pay if he had bought through the regular dealer in beekeeper supplies. More and more, close buyers of beekeepers' supplies are investigating the buying facilities of the Domestic Beekeeper. A word to the wise should be sufficient to cause you to send your next order for beekeeper supplies to the Domestic Beekeeper, Northstar, Michigan.

ROCKY MOUNTAIN HONEY PRODUCERS

We carry a full line of Honey Containers and Bee Supplies. Two five-gallon Honey Cans in Shipping Cases---Export Cases---$1.55; Domestic Case, $1.45. The Cans quoted have a 3-inch screw cap. Both Cans are strongly made, with heavy partitions.

Buy your new Extracting Outfit of us and save money. We have the most practical Capping Melter for commercial beekeeping.

Let us make you a cash offer on your Wax and Honey Crop.

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The demand for our Famous Disease Resisting, Honey Gathering Hustlers is greater than ever before. Untested, 90c; 50 or more, 75c each. Select untested, $1; 50 or more, 90c each. Tested, $1.75; select tested, $2. Virgins, 40c. All Queens by return mail, or soon.

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We do all kinds of book binding, such as magazines like the "American Bee Journal," or any other publication. Also make any style blank book, either printed or unprinted heading

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Following are prices of binding magazines:

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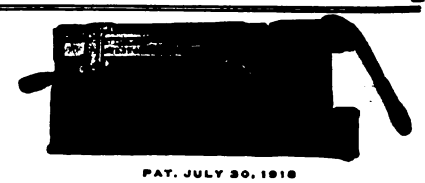

PAT. JULY 30, 1918

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Made for the Huffman Brood Frames. A combined Nailing, Wiring and Wedge Clamping Device. Has been tried and is guaranteed to do accurate work.

PRICE $7.50

Complete directions for operating are furnished with each device.

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ATTRACTIVE CLOTHES

Do not make the man, but they add greatly to his appearance.

Just so with your honey. It must have quality, but should have a neat package and an attractive lebel.

We can furnish the label. In many sizes and shapes suitable to fit any container.

Write for our new price list of honey labels and stationery.

American Bee Journal, Hamilton, Ills.

Crop and Market Report

Compiled by M. G. Dadant

For the July market report we asked our correspondents to answer the following four questions:

1. How is the honey crop compared to last year?
2. What honey have you on hand and what is the demand?
3. Have you had any contracts or prices offered for your 1919 crop? If so, what was offered for extracted? For comb?
4. What do you expect to realize for your crop of extracted? For comb?

THE HONEY CROP

Although the reports are far from complete on all sections of the country, the prospects seem to be very favorable for a good crop of clover honey throughout the east and central west. The crop varies very much in different localities.

The clover crop, however, was short in many sections last year, and it would be very hard for it to be so short again this year. The New England States, New York and Pennsylvania, report a very fair crop so far, and Michigan, although hardly up to last year, states they will have a good crop. Parts of Iowa are very dry, and other parts are wet, and are hoping for dry weather to make a good clover flow. The same thing is true in Illinois. Wisconsin is better than expected, as is Minnesota.

The season now is probably ten days late in all this large section of the country, so that there are still good prospects for a white clover flow.

In the southeast, Georgia and Florida especially, the prospects and honey flow have been very good, probably a little better than last year.

Along the Missouri Valley the honey crop is coming along well, and is at least equal to last season. Texas has very flattering reports, varying from normal to 800 per cent of what was obtained last season. One or two small localities report a complete failure, but in most instances the crop will be extremely good, following several poor years.

The inter-mountain territory has not yet harvested any honey, but is looking for a normal crop.

In California the crop will be short, only yielding probably 75 per cent. Orange flow was good, but the sage crop is extremely short, and the total crop for California, although over 50 per cent, will be hardly 75 per cent of normal.

DEMAND FOR HONEY

The demand is unusually weak in the local market this month. Of course this is natural, for the warm season and nothing else should be expected. One or two localities state that they are entirely cleaned up on honey and that there is a good demand from outside.

CONTRACT PRICES OFFERED

There have been very few offers on honey for this year by the big buyers. One or two reporters stated that they had been offered a very low price, but refused to take it. Two or three others were offered 15 to 17c for white extracted, but were not willing to close at that figure.

A few reports come from California of sales at very reasonable prices to the beekeeper. A two-ton crop of orange honey sold for 20c a pound and a twelve-ton crop of sage at 19½c.

PRICES EXPECTED

Practically in all instances the beekeepers are expecting a good stiff price for honey this year, and they should. Prices of other products have not dropped materially, and honey, unless it is extremely inflated at present, should not drop very low. Most of the reporters desire a price of about 20c for white extracted honey, although some state they expect to be offered only as high as 12 and 15c, with the price of $4.50 to $5 per case for comb honey. The highest price expected by any producer for comb honey was $6 per case f. o. b. shipping point. This is hardly commensurate with a higher price for extracted honey, and give the comb-honey producers the profit they should have.

One thing striking the writer is the absence of reports on comb honey; it would appear as if very little was being raised. If this be the case, there will certainly be a great demand for it, and it should command the highest prices.

CO-OPERATIVE EXCHANGES

It is too early yet for the Colorado Honey Producers to make offers on honey, as their crop is not yet harvested, and they have no chance to sell. The Texas Association is offering its members on a basis of 16c for extracted honey, and 18c for bulk comb. Most of the beekeepers are satisfied with this price, although a few are holding off expecting higher prices, and several have stated that they are going to sell their honey locally at a better figure.

The California Exchange has quoted prices in car lots as follows: Orange blossom 18c, white and water white sage 17c, light amber mountain honey 14c, white amber alfalfa 11c. These prices are guaranteed against any decline on the part of the association up until September 1, 1919. This would signify that the prices as above mentioned are expected to be the very lowest, and that likely the Association will want to raise this price before the season is over. It is to be remembered that the crop out there is light, and since a large part of the honey which finds its way into the big markets comes from California, the action of this Association is not without a great deal of effect.

The Association has appointed three large commission firms to act as its agents in assisting it to market the crop.

THE GOVERNMENT REPORTS ON HONEY

The monthly report of the Bureau of Markets for May 31, 1919, which is the latest we have, contains very much information on the movement of honey, and upon the prices obtained in the different markets. We urge upon our subscribers, wherever at all interested, to get in touch with the Bureau of Markets at Washington, D. C., and ask to be placed upon the mailing list to get the semi-monthly reports of honey arrivals and prices.

This report for May 31 contained, also, some very interesting information upon the kind of containers in which honey is shipped, and the condition in which it arrives upon the big markets.

Taking New York movement and prices as a criterion, it would seem that the honey price is going to hold up very well. New York markets show that western honey is selling at from 15c to 17c per pound, with a few sales at 20c. Porto Rican and Cuban honey is selling at from $1.25 to $1.50 per gallon, and white clover honey at 17c to 20c. This is, of course, for the old crop.

EXPORT OF HONEY

The amount of honey exported from April 1 to April 20, which are the latest dates available, amounted to 591,000 pounds. Totals since last July 1 amount to 8,900,000 pounds. Again it would seem that the price of our honey depends considerably on the amount that is exported. With the coming of peace, the market could be brought to a point which will allow of considerable more export during the coming year than during the past one.

SUMMARY

Taken all in all, the beekeeper should not be discouraged with the price of honey which he is to expect during the coming year. Of course, as stated in our last issue, the final conclusion will depend upon the beekeeper himself as to the price that he will obtain. We do not look for white honey to sell much below 15c per pound, nor do we think that it will reach a price of over 20c. It is possible that prices may be considerably lower than this, although we hardly expect it. It is true that big buyers are not now out after large quantities but likely they are cleaning up all old stock in preparation for the new.

TENNESSEE-BRED QUEENS

Forty-Seven Years' Experience in Queen-Rearing

Breed Three-Band Italians Only

	Nov. 1 to June 1			June 1 to July 1			July 1 to Nov. 1		
	1	6	12	1	6	12	1	6	12
Untested	$2.00	$ 8.50	$15.00	$1.50	$ 7.50	$13.50	$1.25	$ 6.50	$11.50
Select Untested	2.25	9.50	18.00	1.75	9.00	16.00	1.50	7.50	13.50
Tested	3.00	16.50	30.00	2.50	13.00	23.00	2.00	10.50	18.50
Select Tested	3.50	19.50	35.00	3.00	16.50	30.00	2.75	15.00	27.00

Capacity of yard, 5,000 queens a year.
Select queen, tested for breeding, $5.
The very best queen, tested for breeding, $10.

Queens for export will be carefully packed in long distance cages, but safe arrival is not guaranteed. I sell no nuclei, or bees by the pound.

JOHN M. DAVIS, Spring Hill, Tenn.

EXPERIENCE COUNTS

An experienced beekeeper in Iowa writes:

"I must say it is a pleasure to use Lewis Beeware. Have used some that was cheaper, but the difference in quality vastly more than compensates for the difference in price."

A word to the wise—USE LEWIS BEEWARE. Write today. Dept. B

WESTERN HONEY PRODUCERS
1929-1931 FOURTH STREET
SIOUX CITY, IOWA

BEE SUPPLIES

We carry a complete stock of supplies at all times, and can make prompt shipments Our prices will interest you.

A trial order will convince you that our prices and goods are right.

Send Us Your Inquiries

A. H. RUSCH & SON CO.
REEDSVILLE, WIS.

BEES

We furnish full colonies of Italian bees in double-walled hives, single-walled hives and shipping boxes. Three-frame nucleus colonies and bees by the pound. Tested Italian queens, $2; untested, $1.50. Price list free

I. J. STRINGHAM, Glen Cove, N. Y.
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Untested queens, 75c each, 6 for $4.25; doz., $8. Select tested, $1.25. Safe arrival of queens guaranteed.

Package bees, without queens, $1.75 per lb Packages, with queen, 1 lb. and queen, $3.50; 2-lb. and queen, $5.75; 3-lb. and queen, $4.75.

My package is best and lightest in use. Saves bees and express. In case of loss in transit, I will replace loss or recover from express company upon proper presentation of loss by customer. I fully protect my customers from loss.

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Golden Queens

After April 1, untested $1.25 each, 6 for $7, or $13 per doz. or 50 for $48. Also untested 3-band at same price; tested, $3 each, and my very best $5 each. Satisfaction.

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because honey is high. Make it more in demand, so the price will stay where it is. Little stickers on your letters, papers, etc., will help. Printed as below in bright red.

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WESTERN BEEKEEPERS!

We handle the finest line of bee supplies. Send for our 68-page catalog. Our prices will interest you.

The Colorado Honey-Producers' Association
1424 Market Street, Denver, Colo.

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We are still furnishing beehives made of white pine; they will last. A. I. Root Co.'s make of bee supplies kept in stock. Send for catalog giving full particulars; free for the asking. Beeswax in exchange for supplies, or cash.

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AMERICAN BEE JOURNAL

VOL. LIX—NO. 8 HAMILTON, ILL., AUGUST, 1919 MONTHLY, $1.00 A YEAR

WHOLESALE QUEEN-REARING

Methods of a California Queen Breeder Who Rears Thousands of Queens for the Trade---By Frank C. Pellett

THERE is no branch of beekeeping that requires the exercise of so much skill on the part of the operator as queen-rearing. When conducted on the large scale which is necessary to make it commercially profitable as a specialty, the problems are multiplied. To rear a few queens during the honeyflow, when everything is favorable, is a simple matter, but to continue a uniform production, week after week during the entire season, is a different thing.

Under natural conditions, queen-cells are only built in preparation for swarming or to supersede a failing queen. Swarming cells are to be expected only when nectar is coming freely from the fields. The queen breeder must imitate natural conditions as far as it is possible to do so, in order to induce the bees to continue cell-building. The queen-breeder who has a location where a light flow of nectar continues for a long period of time is fortunate. Lacking the natural flow, the usual method is to resort to artificial stimulation by feeding a small quantity of thin syrup, daily, to cell-starting and cell-building colonies.

Migratory Queen-Rearing

We hear much of migratory beekeeping and it is in California that migratory beekeeping assumes such proportions that it is the common practice of big producers. It has remained for a California queen breeder to adapt the practice to his own specialty, and migratory queen rearing may, in time, become popular.

J. E. Wing, of San Jose, is one of the most extensive queen breeders on the Pacific Coast, and probably the first to adopt migratory practice to the queen business. With a sudden termination of the flow at the home yard, he has found it possible to move his outfit a distance of 75 miles, to a point where a honeyflow was in progress, and continue operations without interruption. On one occasion, when the outfit was moved as shown in the photograph, a batch of 109 new cells had been given to the cell builders the day previous, yet 105 were nicely finished, in spite of the 75-mile journey.

M. G. Ward is the queen breeder who has direct charge of the operations, under Mr. Wing's direction, and Bevan Hugh, of British Columbia, is an assistant. The photograph shows Mr. and Mrs. Wing, Wing junior with Mr. Ward and Mr. Hugh.

At the close of the season, last year. Mr. Ward was turning out 1,800 queens per month, with 800 baby nuclei, mating better than an average of two queens each month from each nucleus. Since no queens are sent out till they begin to lay, there is not much time for replenishing bees, in these small mating boxes, from the new queens. This is provided for by means of a reserve supply of colonies in hives, with 17 baby frames. Combs containing bees, brood or honey are drawn from the reserve hives, as needed, and given to the nuclei.

One of the worst objections to the baby nuclei, for mating purposes, is the difficulty of maintaining them. During the honeyflow they do very nicely, providing the queens are per-

Mr. J. E. Wing and family in center, Bevan Hugh at right, M. G. Ward at left

mitted to continue laying long enough to keep up the stock of bees, yet are removed before the small hive becomes overcrowded. The Wing system, whereby the honey-flow is continued by moving to another point when necessary and supplying necessary bees or stores from other colonies, overcomes most of the objections to the small mating box.

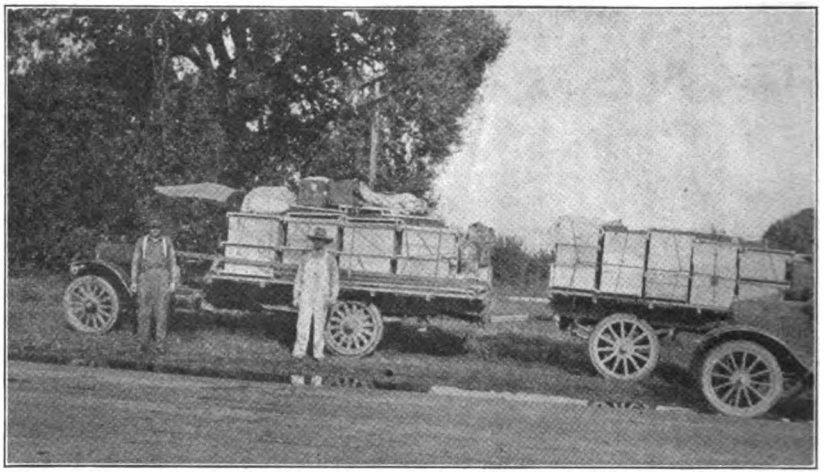
San Jose is situated in the fruit district, where prunes are an important crop. Almonds, filaree and mustard bloom in February, thus starting the season early. Cherries, peaches, pears and apples, together with other fruits, guarantee nectar continuously until late in April. It is not regarded as a good locality for surplus honey, but a light flow, just sufficient for stimulation, is better for the queen breeder than a heavy flow.

In summer there is alfalfa, sweet clover, teasel, horehound and many other minor sources to keep the bees busy. As already mentioned, in order to prolong the season the bees are moved to the river bottom, for honeydew from willows, for late summer and fall. In California there is always something yielding sufficient nectar to keep the bees breeding, from February till October, if one goes far enough. If a breeder can prolong his season one or two months by making a move of 75 miles, he can afford to incur considerable expense to do so. Especially is this true of a concern which can turn out 1,800 queens in a month, as Ward did last fall.

The great difficulty with queen-rearing in the Northern States is the short season. In California, the breeders begin stocking nuclei in March and are running at full capacity by May, at which time northern breeders are just getting started. In the Wing location they count on a season of six to seven months, with five months to full capacity.

The Argentine Ant Pest

The Wing yards are located in a region infested with the Argentine ants. In the December, 1918, issue of this journal is an extended description of the habits of this pest. So far, it has not become established to a serious extent except in a few localities in Alabama, Louisiana and California. It is so destructive to bees that the hives must be placed on stands beyond the reach of the insects. As will be seen by the illustration, Wing suspends his hive-stands from supports by means of wires. The wires are covered with crude oil, which must be renewed frequently. Under favorable conditions, it is not necessary to renew the oil oftener than once in two weeks, but in case of dust storms, more frequent oiling is necessary. If grass or weeds are permitted to grow where they touch the stands, the ants will soon find the way up and will attack the bees.



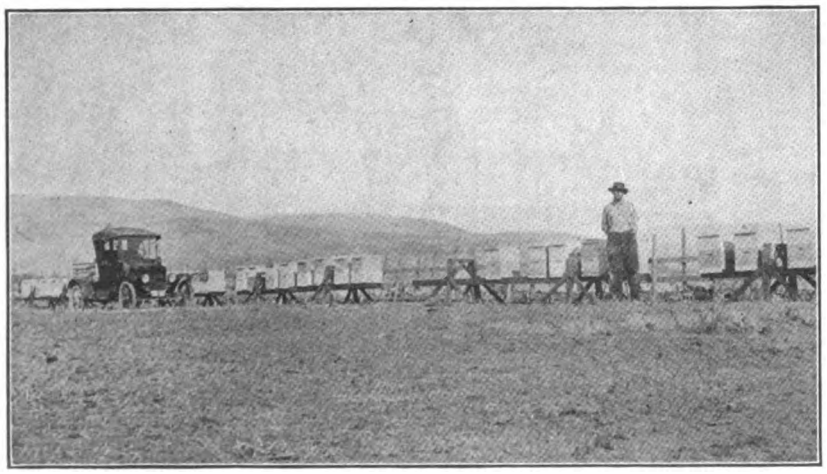
Wing's queen-rearing outfit on the move

As to actual apiary practice, Mr. Ward, who has charge of the queen breeding in the Wing yards, does not depart very much from the usual methods. He dips his own cells, preferring them to those to be bought from supply firms. If there is time he gives each batch of cells to the bees a few hours before grafting, but in transferring the larvæ he uses no royal jelly. The fact that he is able to turn out 1,800 queens in a month's time indicates that he is able to get a large proportion of cells accepted. However, in order to get cells accepted without jelly, all conditions must be very favorable, and the colony in ideal condition. All cells are started with queenless bees and the following day are removed to be finished above a queenright colony. On the 10th day after grafting, all cells are caged or given to nuclei. To stock the nuclei in spring, a swarm box is used with two frames of brood. Bees are removed to another yard to prevent return to original location.

Future of Queen Business

Never in the history of the beekeeping industry has the future prospect been as bright as at present. The abnormal conditions caused by the world war have introduced the use of honey into thousands of homes where it had not been used previously, and hundreds of new markets have been opened for the beekeepers' product. If the beemen are active in organization and advertising, a good market at remunerative prices will be permanent. The expansion of commercial honey production makes such a demand for queens as never has been known before. Although every queen breeder in the land has increased his output and numerous new recruits have engaged in the business, still the demand for good queens has exceeded the supply. There is every indication that the queen breeder who sends out only good stock and gives his customers prompt service, will never lack for a market for his output.

So keen is the demand for queens that large producers can only be sure of getting a sufficient supply by rearing them in their own yards.



One of the Wing apiaries on platforms supported by wires coated with oil, to avoid ants

Some Observations on Nosema-Disease

By G. F. White, Bureau of Entomology, Washington, D. C.

(Continued from July)

Symptoms of Nosema-disease

From what has already been said it is seen that weakness is one of the colony symptoms of Nosema-disease. When a sufficiently large number of the bees of the colony are infected and the infection persists for a sufficiently long period, weakness will inevitably result and become apparent. On the other hand, when only a small number of bees are infected, or

the infection persists for a short period only, the weakness resulting passes unobserved. The loss in strength is more often gradual, but may be quite sudden.

The diseased bee, as to its outward appearance and general behavior, is not particularly unlike the healthy one. The infected workers carry pollen, honey and water, and at the entrance of the hive cannot be distinguished from healthy ones. It was found, from experiments carried on during the fall and early winter, that the cluster of heavily-infected colonies was easily disturbed, and when disturbed, the bees ran badly.

As a rule, the stores in a Nosema-diseased colony are sufficient. The queen does her work well, and when the colony dwindles and dies out she is usually to be found among the last handful of bees. The brood is normal in appearance, but is frequently in excess of the amount that can be comfortably cared for.

Sooner or later the stomach of the diseased bee invariably furnishes positive evidence of the presence of the disease. Usually by the end of the second week, following the infection, the organ becomes lighter in color. It is also somewhat larger, softer and more easily torn. Late in the disease its size is about that of the healthy stomach and it is almost white. This colony symptom is the most valuable of all and furnishes positive evidence of the presence of Nosema-disease.

The spotting which characterizes dysentery is absent, and the trembling that is frequently described for one, or possibly more, abnormal conditions of bees, is not a noticeable symptom of the disease. While not infrequently there are more dead bees on the ground in front of a hive housing a Nosema-diseased colony than a healthy one, a heap of bees, such as is so often found in front of hives where paralysis is present, seldom, if ever, occurs in Nosema-disease. In experiments conducted in the fall and early winter, more dead bees were found on the bottom-board, in case of inoculated colonies than uninoculated ones. The crawling and climbing tendency of bees, described as symptoms in some bee troubles, does not characterize Nosema-disease.

Adult Workers, Drones and Queens Susceptible to Nosema Infection

After a colony, free from the disease, has been fed syrup to which the parasite (**Nosema apis**) has been added all, or practically all, of the workers of the colony become infected. When there are drones, in the colony, they also become infected in a somewhat similar proportion. When queens from such colonies are examined they, too, are sometimes found to be infected, but frequently they are not. From observations thus far made, infected queens are less likely to be encountered during the active brood-rearing season than at other times of the year. In the experience of the writer, no Nosema-infected drones were found except in colonies in which the disease was produced by artificial inoculation. It is interesting, also that the old, shiny bees in nature were not found infected. That they are susceptible, however, to infection, was demonstrated, as was done in the case of drones, by experimental inoculation.

Brood Not Susceptible to Nosema-Infection

Studies were made of the brood in experimentally infected colonies, and in no instance were infected larvæ found, either worker, drone or queen. The pupæ, likewise, upon examination, were always found to be healthy. Young bees emerging from the brood-comb were invariably free from infection.

Length of Time an Infected Bee Lives

It is not known positively whether a Nosema-diseased bee ever recovers from the disease. Some of the observations suggest that now and then a worker recovers from the infection. If this ever occurs, it is decidedly the exception, for they usually die. It should be emphasized here, that a bee does not die of the disease soon after becoming infected, but lives for a relatively long period. As the length of life of healthy queens, workers and drones, respectively, is different, so it is to be expected that the period of life of infected ones will also be different. Infected queens will probably live longer than infected workers and infected workers will live longer than infected drones. That the age of the bee at the time of infection will determine to a certain extent the period it will live, is evident from the nature of the disease. That the season at which infection takes place has much to do with the period a worker infected with **Nosema apis** will live is also evident from the nature of the disorder. Infected during the more active bee season, a worker will live longer, other things being equal, than if infected during some less active season. During the winter season, at least, the strength of the colony to which an infected worker belongs, and the percentage of diseased bees present, probably have something to do with the period the worker will live. Observation made on medium-sized colonies, inoculated late in the fall, showed that most of the workers live more than 2 months, but less than 3. During the summer most of the infected ones die in less than one month.

There is considerable evidence to indicate that queens are not as readily infected as are the workers. This seems to be true especially during the more active season. Among the queens taken during the active season, from experimental colonies in which a heavy infection among the workers had been produced, as the result of inoculation, rarely have infected ones been found. There is some evidence, also, that queens, under favorable circumstances, may recover from Nosema-infection. A careful microscopic study of queens from infected colonies, made during the less active season, showed some free from infection, others heavily infected, and still others with only a slight amount of infection.

It will be seen that the question, relative to the period an infected bee lives, is dependent upon many factors and that considerable data must yet be obtained before statements of a more definite character can be made.

Length of Time the Germ Lives

After the germ of Nosema-disease is voided from the alimentary tract it invariably dies unless it is taken up by some other bee. The same is true of the germs in the body of bees that die of the disease. They do not die immediately, however, but live a variable length of time, depending upon the environmental condition. The question relative to the period the parasite will live when subjected to heat, drying, sunlight, fermentation, putrefaction and freezing, respec-

M. G. Ward grafting cells

tively, was the subject of a considerable number of experiments. The periods it will live in honey, in pollen, and when in the body of dead bees, were also subjects of study.

The approximate period the germ (**Nosema apis**) remains alive, in each of the various environments, respectively, is as follows:

Suspended in water, the germ was killed at a temperature of about 136 degrees F., in 10 minutes.

Allowed to dry outdoors, in an empty hive- body, it was dead in about 2 months. Drying at room temperature, it lived about the same length of time.

When dry and exposed to the direct rays of the sun, it was destroyed in from 15 to 32 hours.

In honey, and exposed to the direct rays of the sun, it was usually destroyed by the heat acquired by the honey during the exposure.

In a 20 per cent honey solution, fermenting at outdoor temperature, it was destroyed in about 9 days.

In a putrefying suspension, at outdoor temperature, it lived more than 3 weeks.

The germ withstood more than one freezing in water. How often it will withstand freezing and thawing has not been determined, and likewise the length of time it will live frozen in ice is not known at the present time.

In honey, at room temperature, the parasite lived from 2 to 4 months.

Mixed with pollen, it dies, but lives somewhat longer than when allowed to dry in an exposed environment.

The germ lived in the body of the dead bees, at room temperature, about 4 weeks, at outdoor temperature about 6 weeks, and at icebox temperature about 4 months.

In the body of dead bees lying on the soil, in the open, but somewhat protected, it lived from 6 to 10 weeks.

The temperature is a factor in the environment which has much to do with the period **Nosema apis** will live.

Spread of Nosema-disease

Naturally the problem of the spread of Nosema-disease could be completely solved if it were possible to follow the germ (**Nosema apis**) in nature, during the period it remains alive and outside the living bee. Unfortunately this is well-nigh impossible. Much can be done, however, and already some important determinations have been made. From the studies made, it has been possible to separate the modes of transmission which are most likely from those which are not so likely.

By feeding colonies syrup, to which the germ was added, it has been shown that Nosema-disease is produced. The same is true also if water, to which the parasites are added, is given to bees. Nosema infection of bees takes place, therefore, by way of the alimentary tract. This fact is especially important in estimating the probable source of infection, in Nosema-disease.

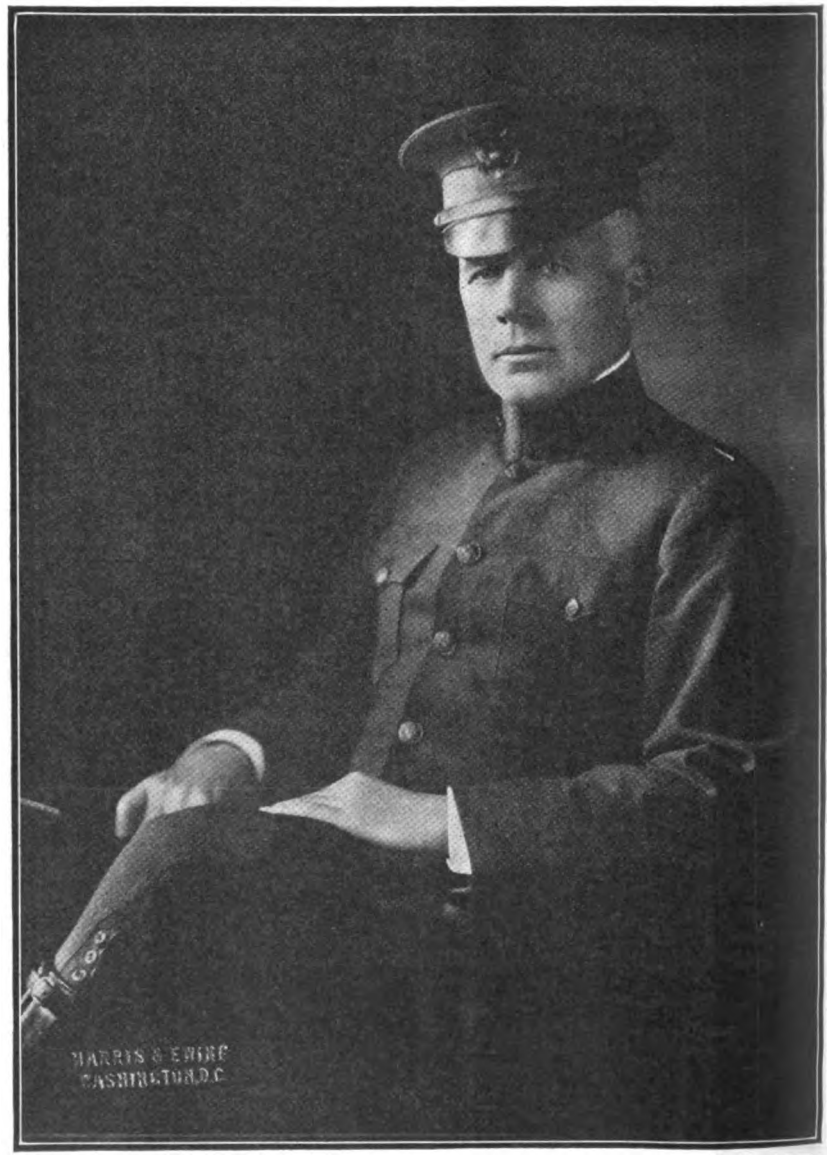
For purposes of discussion, the problem of the spread of the disease may be classed into 3 subdivisions—the transmission (1) from the diseased apiary to the healthy one, (2) from the diseased colony to the healthy one in the same apiary, and (3) from the diseased bee to the healthy one in the same colony.

The question of the spread of Nosema-disease from apiary to apiary, and from one section of the country to another, cannot have the same interest to American beekeepers as does the question of the spread of the foulbroods. This is true because Nosema-disease exists already, it may be said in a general way, in all sections of the United States, and furthermore, it probably has had this wide distribution for centuries. From the facts which have been established regarding the period the germ lives in the different environments in which it is likely to be present, the beekeeper is enabled to estimate, with some degree of satisfaction, the likelihood of the germ being transmitted from one apiary to another and producing disease.

That infection, from one colony to another, occurs is certain, but the exact means by which it takes place is not entirely known. In the experimental apiary the diseased colonies had free access to the flowers of the fields, as did also the healthy ones. In none of the many experiments that were made, from 1912 to 1916, inclusive, did Nosema-disease appear in the uninoculated colonies during the active bee season. If it were at all likely that Nosema-disease is transmitted by flowers, to an appreciable extent, there would have been a different observation to report in this connection.

Experiments were made, in which brood-frames from Nosema-diseased colonies were inserted, during the active bee season, into healthy ones, after they had remained out of the hive for a variable length of time. Others were inserted immediately after they were taken from the hive housing a diseased colony. In no instance did Nosema-disease appear to any appreciable extent.

(To be continued)



Dr. G. F. White, an eminent bacteriologist and the author of several Bulletins of the Bureau of Entomology, was the first bacteriologist to describe the two kinds of foulbrood, bacillus larvæ and bacillus pluton. His descriptions of the bacilli of foulbrood are accepted in both hemispheres as correct

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language. Consolidated with The National Bee Journal in 1874.

Published monthly at Hamilton, Illinois.

Entered as second-class matter at the postoffice at Hamilton, Illinois.

SUBSCRIPTION RATES—In the United States and Mexico, $1 per year; three years, $2.50; five years, $4. Canadian postage 15 cents, and other foreign countries 25 cents extra, per year.

All subscriptions are stopped at expiration. Date of expiration is printed on wrapper label.

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THE EDITOR'S VIEWPOINT

Preparation for Winter

Hardly seems appropriate to urge now the preparation of colonies for winter. But good, vigorous queens soon will mean a strong lot of bees to start in the winter.

If there is a honey dearth and bees run short it may be necessary to feed to keep up breeding or even the best queen will fail to fill the hive with plenty of bees for winter.

Remember that the three requisites for successful wintering are plenty of good stores, a large force of young bees, and sufficient protection. We can give the last one of these later on, but the first two must be in preparation before fall comes.

Now is the Time to Requeen

It is always time to requeen if queens are available, and if your colonies are deteriorating on account of lack of new stock.

But in the spring, when conditions would be most favorable for observing the colonies and finding the worthless or poor queens, it is not always possible to get the queens from the breeders in the South, and the danger of loss in the mails is greater.

For these reasons probably a large proportion of beekeepers requeen in the summer. It is best, of course, if possible, to keep close tab on your colonies as to honey-gathering qualities, disease-resistance, gentleness, etc., and then breed from your best stock by one of the best methods.

But many otherwise good beekeepers keep no accurate tab on individual colonies, and many more do not care to enter upon queen-raising. These may profitably requeen by buying their stock.

How old should a queen be before she ought to be replaced? Usually not over two years old. Most large beekeepers agree that a queen after she has passed her second season of prolific laying is apt to decline, and either the next fall or spring become worthless. Nor can she be judged by the work she is doing now, what she will do in three weeks from now, or two months.

We would advise, therefore, general requeening every two years unless it is desired to keep the best stock for experiment or for breeding purposes, and this is especially true for the beekeeper who does not keep accurate records.

Queen Breeders Catching Up

After one of the wettest springs, a condition which is not conducive to best results in getting out capacity orders on time, the queen breeders are at last catching up on orders.

Many reliable breeders have had to disappoint customers simply because they took orders up to their capacity and found themselves at the last moment unable to fill such in time on account of the weather.

Watch for Moths in Extracting Combs

The careful beekeeper will not let the moths infest brood-combs on which the bees have died during the winter. He will either place these in the care of a strong colony, make divides into them, or thoroughly fumigate to kill the moths.

He is apt, however, to rely on the cold winter having destroyed all moth in his extracting house and consider his supers immune. Usually they are. But we must be prepared for the unusual.

Our suggestion is that such combs as are not used on the hives before midsummer, owing to shortage of crop, be gone over every two weeks to make sure moths have not made their appearance.

"An ounce of prevention is worth a pound of cure." A little disulphide of carbon on a rag on the top of each tier, carefully covered, is sufficient.

An Anzac in Hamilton

A bright young Australian, John H. Rosser, from near Brisbane, passed through Hamilton recently on a visit. He is 26 years old, served in a regiment of Australians at Le Cateau, and came to America on his way home. He is an active beekeeper, has been a subscriber of the American Bee Journal for 10 years and concluded to make a tour of the world while away from his native country. He reached Europe through Egypt, the Mediterranean and Italy; then, after the armistice, went to England. There he embarked for the United States. In New York he bought a motor cycle and started westward, visiting beekeepers on the way. He left us June 21 for Des Moines. From there he went to Denver, thence to San Francisco, where he expects to sail on August 12 for his home country, after visiting Hawaii. He will reach home just in time for their spring work, which begins in September. That month is to them the same as March is to us, with the only difference that they live in a warm country with but light frosts in the coldest July weather. Being at the antipodes, they have winter while we have summer.

Honey Prices

I really believe honey prices for the coming winter are worthy of an editorial.

Our untiring friend, Dr. Bonney, who still seems to have the eagerness of the cowboy that he used to be, writes us, enclosing printed quotations of the Montgomery-Ward Co., at Chicago. These quotations offer honey in 60-pound cans at $16.25 and in gallon cans at $3.70. They also offer maple sugar at 42 cents the single pound. Here is the doctor's letter:

My Dear Mr. Dadant:

I attach clippings from a catalog "of July-August" just at hand from Montgomery, Ward & Co, **and the customer pays the tariff.** I am now inclined to start prices at 25c a pound locally, and 30c by parcel post. That would mean $3.60 the gallon, cheaper by 10c than the mail order house list, but really less by nearly 3c a pound, with the postage paid.

Might I suggest that you touch on this editorially, using the slip about

maple sugar at 40c a pound to fortify an argument for good prices of honey?

White clover flow short. Too much rain, and the clover is not, even now, when the weather is dry, yielding as it should. There will be, I think, a short crop in Iowa.

Truly,
A. F. BONNEY.

The doctor appears to use sound reasoning. Let us not undersell each other. Everything is high, whether in the line of food or in the other lines—clothing, building material, etc.

Some of our friends accuse the "profiteers" of causing the high prices. We believe that the cheapness of money is at the bottom of it. Is the farmer a profiteer because hogs are 20 cents per pound, cattle 16 cents and corn $1.80? Everything is on the same scale. Labor has advanced and is not likely to go back to the old schedules for a long time, if ever. The only man who loses on these advances is the one who has a specified income based upon money at interest. That item has not yet raised, neither is it likely to raise. So there is no reason why the honey producer should not get at least twice as much for his honey as he used to get.

Dr. Arthur H. McCray

Dr. Arthur H. McCray, whose death was mentioned in the July number, was one of the scientists who helped diagnose bee diseases. In our account of the work undertaken at Washington, by the Bureau of Entomology of the U. S. Department of Agriculture, we gave, in February, 1916, a description of the work of Dr. McCray, as bacteriologist in the examination of samples of diseased brood received from beekeepers in all parts of the country.

This, however, is not the only work due to this eminent worker, on subjects that interest beekeepers. Dr. McCray, in connection with Dr. G. F. White, wrote Bulletin No. 671 of the Bureau of Entomology on "The Diagnosis of Bee Diseases by Laboratory Methods."

More recently Dr. McCray had been State Bacteriologist of Montana, and while thus engaged carried on investigations on Rocky Mountain spotted fever. He contracted this disease during his studies and it was the cause of his death. He was therefore a "martyr to the cause of science," and we should regret his death the more on that account. True courage is not only in fighting an enemy face to face. Many a scientist has lost his life in seeking to remove disease or prevent its spread.

The Evening Star, of Washington, D. C., had this to say about Dr. McCray's death:

"Dr. McCray, who was conducting experiments to isolate the germ of spotted fever, became infected while dissecting the carcass of a guinea pig, developed the disease, and after a prolonged fight for life, succumbed. High tribute to the memory of the physician was paid by Governor

The late Dr. A. H. McCray

Stewart and state officials, among them the state doctors with whom Dr. McCray had worked.

"Dr. McCray was born at Reynoldsville, Ohio, 38 years ago, and was married in Washington in 1915, to Adele Wilson, superintendent of the nurses' school at George Washington University in that year. He served as a lieutenant in the Medical Reserve Corps during the war."

Queen Breeders Versus Queen Buyers

No season yet, to our knowledge, has caused so much dissatisfaction between queen breeders and purchasers of bees, as the one just ending. We bred queens for sale ourselves, years ago, but soon decided that the breeding and selling of queens was injurious to a man's peace of mind. So all the queens that we have handled in the past 30 years have been produced by others. We are therefore well situated to give a curtain lecture to both buyers and sellers.

Queen breeding is very much like the raising of cabbages or melons; that is to say, we have to depend a great deal upon the season, the moisture, the sunshine, the absence of parasites, etc. We might promise melons for a certain date and find ourselves unable to supply them, even after great exertions.

The queen breeder has many obstacles to surmount. He is not always able to sell his entire output, and it is unusual for him to secure orders early in the season, for as large a number as he can fill. We therefore do not hold it much of a sin if he accepted more orders this year than he is sure of being able to fill. On the other hand, he should consider the customer's money as not earned, and therefore not his own, until he has filled the order sent to him. He must put himself in the customer's place and decide that the only way to retain his credit and do the fair thing is to refund the amount of the order, whenever it is demanded if unable to fill a promise.

The customer, on the other hand, must recognize the fact that queens are not kept in a bushel box, ready to be sent on 5 minutes' notice. If he has sent his order early, with the conditions and date of delivery well stipulated and agreed upon, he has a right to expect the goods or the money back, even though it may be a hardship on the breeder. But how many customers send money for a queen, to be delivered **by return mail?** Of course the man who pays his money and to whom the offer has been made to fill an order by return mail has a right to expect it. But in many cases beekeepers do not even enquire whether the breeder is ready to fill an order. They send the money, and their ire is aroused if the queen does not promptly arrive. Some even make the mistake of removing and killing the queen which they wish to replace, on the day upon which they send their order. And let us state here that this is the very poorest way to succeed in queen introduction, even if the queen should come without any postal delays

One more word. When queens are lost in transit, it is usually the shipper's loss. The consignee has therefore bad grace in being angry at the loss which he often charges to the shipper's ignorance, when it may be due only to circumstances beyond his reach. Shortage of weight of bees by the pound is often due to wear and fatigue in transit, and a nice lot of bees at the start may look very poor on delivery.

The American Bee Journal will not knowingly accept advertising of unreliable breeders, but it hopes that the customers will entertain charity for the unsuccessful efforts of hard-working queen breeders, when the season is against them.

AUSTRALIA, THE BEEKEEPER'S PARADISE

By Tarlton Rayment, Author of "Money in Bees," Etc.

(Copyright by the author)

West Australia

The great commonwealth of Australia has often been described as a land of "magnificent distances." So it is; it is so far removed from the home land of most of its original settlers that it is "down under" or, to use another term, it is the antipodes, and far too vast to attempt anything descriptive in less than six chapters. "Why six?" Well, there must be a limit somewhere, and since the largest star on our national flag has six points—one for each State—we have decided to give a point likewise to each of them. To avoid all interstate jealousies we propose to deal with them in geographical order, and should we degenerate into the vernacular, as most "Aussies" are prone to do, the appropriateness of the designation will be our chief excuse.

What a scintillating cluster is the Southern Cross. West Australia, South Australia, Victoria, New South Wales, Queensland, and, we almost forgot the "Apple Garden"—Tasmania. Unlike the Poet who went from east to west, we go the reverse, west to east. So here goes "The West."

It's a very wonderful country, immense, rich, pleasant, healthy, new. Its chief features are coastal forests of mighty Eucalyptus trees that rival the giants of America. The other great division comprises the gold country, yes, it has miles and miles and yet more miles of open plain country, baked under an ardent sun. Now don't jump to conclusions, the plains may prove a veritable flower garden. "Good for bees?" No one has tried it, but a kinsman who has traveled the interior tells me that he rode for days, and long days, too, through apparently unending beds of red "everlastings," then just as suddenly the color of the flowers appeared to change, and mile succeeded mile of white "everlastings," then yellow, and so on, until the whole affected one like the changing tints of some kaleidoscope. But my kinsman was after the gold that men dig for in the bowels of the earth, so the glory of the golden flowers did not receive its due. And there's not much water there, though "The West" possesses one of the most remarkable pipe lines in the world, for it is by pipe that water is conveyed to one of the great inland mining towns. It's "some" tube.

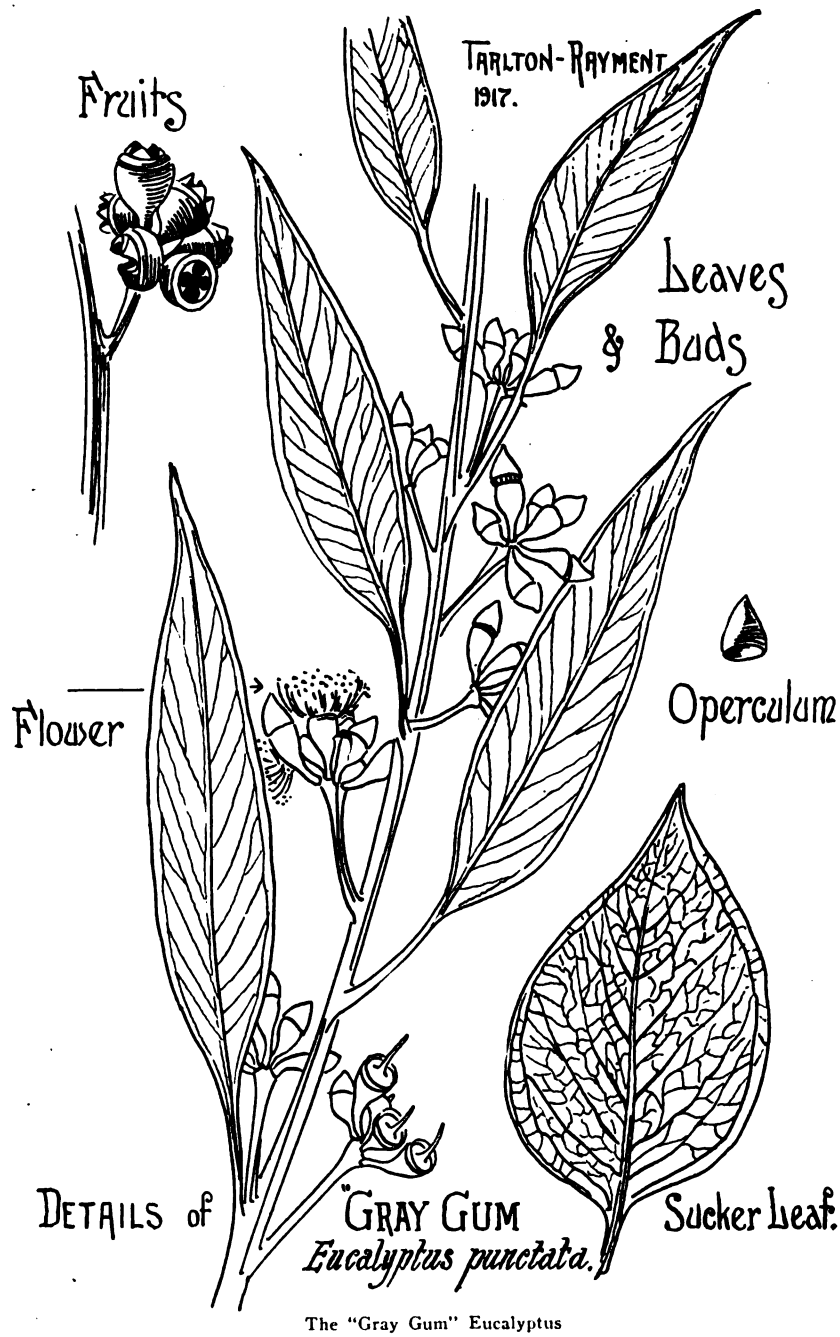
But we've strayed too far, or perhaps not far enough, for away to the northwest of the State are great cattle runs, and since the conditions are somewhat similar to those of the "Never Never," as the northern portion of South Australia is often called, we will deal more fully with the flora under the heading of that State. On the coast that borders the Indian ocean, pearl fishers pursue their enthralling quest to the accompaniment of sudden squalls that toss the tiny craft clear of high water mark or else, as the Germans say, "spurlos versunken," sunk without a trace.

Wist a moment. We have our magic pen.

First, a subtil fragrance steals through the forest air. It is delicate, yet insistent. "Chop—Chop—Chop—Chop, the rhythm of the axemen's blows provide the music of the bush. The sharpened steel rings as it cleaves the forest's boles; with a swishing roar the lofty giants hurl down deep into the world of the forest floor and through a million waving stalks of the richly perfumed boronia. The scent gets overpowering, yet the bushmen toil at the "Jarrah," or "Karri" logs that the mills may be fed. Do the gum trees "Jarrah" and "Karri" (*Eucalyptus marginata*) and (*E. diversicolor*) yield honey?

Yes, but it is strong-flavored and dark; but there are other "gumtrees" that yield heavily, while the quality is excellent, the "Yate" tree (*E. cornuta*) especially.

In spring there is the ubiquitous "Cape weed" (*Cryptostemma calendulaceum*) to gild the fields and the pockets of the apiarists, while nearer the south there are the glorious crimson-



The "Gray Gum" Eucalyptus

flowered "Red Gum" (*Eucalyptus calophylla*) "Flooded Gum" (*E. rudis* and *E. decipiens*), West Australian "Blue" Gums (*E. megacarpa*) and hosts of other plants too numerous to name.

Yet there are few beekeepers in "The West." Generally spoken of as a dry climate, in the coastal areas the wet is the chief drawback.

It is a young country, very young, indeed; but it has immense possibilities before it, and, as we have already remarked, it is, in the main, untouched, from the apiarists' standpoint. The climate is refreshing and most who have visited "The West" either on business or pleasure, desire to return again. Its vastness is difficult to comprehend, but that very extent holds out promise of prosperity for the hundreds of thousands who must eventually reside there.

(To be continued)

Control of Swarming for Comb Honey

By F. R. Smythe, D. V. M.

WHILE claiming no originality for this method, it being the culmination of the various technique used by Doolittle, Geo. W. Stephens, Dr. Miller and many other unselfish beekeepers, which I have sifted out of their numerous articles in the last twelve years, plus a great many experiments, I submit it to the beekeeping fraternity for what it is worth, hoping they can suggest some improvements.

Being employed by the U. S. Government as a Veterinary Inspector, and not having much time to devote to the bees, I was compelled to adopt some plan to control swarming in the production of comb honey, and after trying a great many methods, I have adopted the following:

During fruit bloom (if in single story) put on full depth hive-body with full drawn combs **above** on all **strong** colonies; if not strong, unite so they will be (if in two-story put top body on bottom, and bottom body on top), as the kind of colonies I keep will, in this locality, swarm during fruit bloom, even if they have four full-depth bodies, if I leave the brood on top till it becomes congested.

Just before the main honey-flow put top body down on side, after preparing two bottom-boards by cutting a space 5/8x5 or 6 in. in one side of each, equal distant from each end; tack piece of queen-excluder zinc on one of the openings.

Put best frames of sealed brood in this side body, place queen and other frames (be sure to have some unsealed brood) on old stand, put two-comb supers on with bait sections in top one. Close front of side brood-chamber. Put on Excelsior or Ventilated gable cover on side hive, but give ventilation by raising back and top of side brood-chamber about one-eighth or three-sixteenths inch with a strip of section or small wedge.

About every 10 to 14 days switch brood to side hive. I generally take the three outside frames from the side hive, then put two frames from parent hive into side, then as I take one from side hive I put one from parent hive, of course keeping lookout for queen, putting her back in parent hive with frame she is on if it contains, as it usually does, unsealed brood. If the queen has run over and is on a sealed frame, I stand it to one side until done, then shake or brush on top of frames of parent hive. If running for extracted, put on excluder, if for comb no excluder is necessary.

This plan was perfected for comb honey production, but is worth while in running for extracted.

This method will, in this locality, absolutely prevent swarming, give 50 per cent more comb honey and of better finish, 100 per cent increase if wanted, after having the use of an extra strong colony for honey production; no nuclei to fool with other than queen-mating nuclei. I am working on a scheme to raise queens in this side hive.

Important Suggestion Derived From Experience

1. Have good, substantial hive-stand wide enough to hold two hive-bodies; be sure to have it level sideways and see that it does not **sag** in the center to leave space for bees to get out.

2. Bend excluder zinc thus:

and tack well inside and on top of side strip of bottom-boards after cutting out so zinc will go down flush with side of bottom-board.

3. Put excluder zinc always on the same side, right or left, so as to have them standard.

4. Stop entrance of side hive so bees will have to go through parent hive.

By putting comb in body you put above, and plenty of honey in lower body, the queen spreads the brood-nest upward and the bees in carrying the honey above for brood-rearing stimulate the same as a heavy honey-flow. I generally see that they have at least four Langstroth frames

The "mealy Stringy-Bark" Eucalyptus of Australia

of honey in lower body (more will do no harm), two on a side.

If I want increase, after the main flow, or a few days after making last transfer, I generally make two. If I make increase three, the last one about August 1, set side hive on new stand and give, after two days, a ripe cell, or better, a laying queen.

In my opinion the primary cause of swarming is a preponderance of young bees in the brood-chamber.

Have young, prolific (not over 2 years old) queens from a gentle strain of Italians.

This method requires some work (not as much as cutting cells, and no sulking by the bees), but will produce more returns from a small apiary than some of the larger ones I know, this being especially desirable at this time of food scarcity.

And in this locality absolute control of swarming.

Cincinnati, Ohio.

Honey Selling

By Edward Hassinger, Jr.

WITH honey producers organizing as they are, it seems that honey advertising should be conducted along an organized line; that is, advertise honey in general with illustrated and printed placards, telling how to use honey to flavor and sweeten ice cream, all kinds of berries, salads, cold and hot drinks, and in fact any food that needs flavoring and sweetening. These placards should be made short and to the point, such as:

FLAVOR and SWEETEN
ICE CREAM
HONEY

A special one for ice cream parlors could be something like this:

Try our
HONEYBEE HONEY
SUNDAE
IT'S DELICIOUS!

Every ice cream parlor and soda fountain in the country should have two such placards in view, and honey with a good flavor supplied on trial if necessary, for each place.

Every grocery could have one like this:

FLAVOR and SWEETEN
BERRIES and SALADS
WITH HONEY.
We sell it.

The placards could be printed by some company interested in placing honey before the public, and print them as reasonable in price as possible; then advertise them in the bee journals, and supply manufacturers could also list same in their catalogs.

State and County Beekeepers' Associations could spend all surplus funds for such placards and buy them in large quantities and distribute to the individual beekeepers for distribution, or have one or more of the officers of a local association assigned a certain territory to distribute the placards.

Special placards could be gotten up for schools in connection with bulletins teaching the value of honey and its uses in cooking and baking.

Suppose the editors of the American Bee Journal and some advertising specialist agree on the proper words to use and then thoroughly advertise the proposition to bee-keepers and take orders with the understanding that if the orders are large enough collectively to warrant printing same in large quantities, then same would be printed and orders filled.

Hortonville, Wis.

A Few Reasons For Keeping Records

By Florence B. Richardson

WHY is it that more beekeepers do not keep records? How do they know the lineage of a queen in a certain hive?

All these things are definitely known only when true records are kept. Many say, "Oh, I don't have the time to fuss with that kind of business; but the same person will find the time to "fuss" with a colony whose former record, if on file, would tell that it would never make a producer. The time thus spent could be made much more profitable if employed in the business of record keeping. The beauty of it is that there is no necessity for guess work. When one has only a few colonies it is easy to keep the performances of each one in mind without the use of pen or pencil; then, too, there is an enthusiasm which does not allow one to forget. When, however, the number of colonies gets to the point where it is a business instead of a hobby, there is something more to remember, and the aid of a record is a decided advantage.

The field notes may be only the sketchiest, but if interpreted after the day's work is done, there need be no mistakes. A small block of paper that will fit into the ordinary overall pocket is really the handiest, as after the work of the day is completed the leaves can be torn off, taken to the house and transcribed in a few minutes, while the block remains in the pocket to be used the next time it is needed. A short stub pencil attached to the operator with a string is the handiest arrangement to save hunting for it when in a hurry.

The bee business is, today, more than ever before, receiving attention from all classes of people, and if a business is worth going into at all it must be run on a business-like basis. We would think it sheer folly for a man or a woman to go into the dairy or poultry business without keeping records. Not only general records, but itemized records of each individual or pen. Why is it not as necessary to know the exact value of our colonies of bees, not only collectively but individually? If we have a cow or a hen who is not paying her way or is diseased, do we tolerate her? Certainly not. We either sell her or bury her. With the bees we do not have to use such extreme measures, for it is generally possible to introduce new blood from a high-producing colony and within a reasonable length of time have a greatly improved colony where there might have been an empty hive.

An outbreak of disease can be checked much sooner and with more surety if the record of the colony is known, and there is also less danger of leaving a colony to its own devices, if a record is kept, as in going over a colony's work the time since the last overhauling will be noticed and a special effort made to check up on it soon.

A small card index can be purchased for less than two dollars a set of cards, lined to receive entries and cut to fit the box, also a numbered index can be bought for a small additional sum. More cards can be added at any time and the records are continually on file. A few minutes' time will fill out a card, either on a typewriter or by hand. The initial expense is small and the ultimate results are large.

In a well regulated apiary there are two sets of these records, the ones at the yard and the one in the card cata-

The small honey sign is the cheapest mode of selling honey locally

log or other systematic holder. The set at the yard may be on cards strung on a heavy string or wire, which can be attached to the cart or other carrier of tools in use. If strung in order, this form of record is simple and convenient to use, as a leaf at a time is turned, like a calendar. Some people keep a sort of record of queenless colonies, yet none after the colony is in good working order again, while others simply mark the hive so as to watch it during the requeening process (if they don't forget.)

I believe everyone who keeps records has a code all his own, as every little while we hear of someone who has at last perfected a system of quick notation which is quite the finest thing that has ever been used. There are a few signs used by everyone and a code of any kind is only good if it can be read after it is—maybe not quite cold, but at least lukewarm.

A few of the most used terms, abbreviated, read: ex. bd. for excluder-board; brd. for brood, fr. for frame or frames, ql. for queenless, col. for colony, div. for division or divided, ext. sup. for extracting super, hv. for hive, bb. for bottom board, cv. for cover, e for eggs, l for larvæ, foun for foundation, hon for honey. Various combinations are made with the characters, but when put onto the final card almost all words are written out in full. A card in the little catalog would read something like this:

1918. Colony No. 15.
May 2—Gave excluder board. Gave 2 frames e&l to No. 6.
May 6—e&l in top. Shifted bodies.
May 20—2 hatched cells in top. Strained bees, no queens.
June 30—8 frames of honey.
July 14—5 frames of honey.
July 22—3 frames of honey.
Aug. 10—2 frames of honey.
Sept. 29—In fine shape.

Dr. Miller has for many years been advocating and practicing the keeping of exact records and in all the bee world there can be no busier person than our genial ever-ready help in times of trouble and doubt, Dr. C. C. Miller.

These are only a very few of the many arguments in favor of keeping definite records, but their reasonable use will appeal to all modern and progressive beekeepers.

Hughson, Calif.

Spanish Needle for Winter Stores

Knowing that your bees are located along bottom lands, and that you, no doubt, gather quite a little honey from Spanish needles some seasons, we are writing to ask what your experience has been in wintering bees on this honey.

In your opinion, about how many colonies would it pay to move a distance of 12 miles to a 60-acre field covered with a very heavy growth of Spanish needle? The plants are about 3 feet in height now, and will not bloom for some time to come.

We are well equipped for moving 60 colonies at a load, including covers, hive-stands and alighting-boards. Roads are of the best and hauling is done by auto truck.

Minnesota.

We have never had any trouble in wintering bees on Spanish-needles honey. The kind we have is named "bidens aristosa" by the botanists. There are some 15 different kinds of "bidens" described by the botanists, some of which yield no honey.

I would think that 60 colonies would do well on such a field, especially as there would probably be similar fields in the vicinity. However, the moving of bees is always more or less trouble and it pays only when there is positively no hope of any crop in their home locality. We have moved bees for the Spanish-needle and persicaria crop and had good success. We would suggest that you try it on 60 colonies this season and, if it pays, increase the number another year.—C. P. D.

Introduction of the Honeybee to California

By J. S. Harbison

THE introduction of the honeybee into California was an important event, and engrossed a large share of public attention; wherefore, it is peculiarly appropriate to preserve as full a record of the transaction as possible.

The following letter from one of the earliest and most successful apiarists of this State, contains an authentic account of the introduction of the first bees in California, as well as the success attending their first five years' cultivation in San Jose Valley.

San Jose, Jan. 11, 1860.

Mr. J. S. Harbison:

Dear Sir: Yours of the 26th of December, propounding certain inquiries, has been received.

The first bees imported into California was in March, 1853. Mr. Shelton purchased a lot consisting of 12 swarms, of some person to me unknown, at Aspinwall. The party who left New York became disgusted with the experiment, and returned. All the hives contained bees when landed in San Francisco, but finally dwindled down to one. They were brought to San Jose and threw off three swarms the first season. Mr. Shelton was killed soon after his arrival, by the explosion of the ill-fated steamer, Jenny Lind. In December, two of the swarms were sold at auction to settle up his estate, and were bought by Major James W. Patrick, at $105 and $110, respectively.

Mr. Wm. Buck imported the second lot in November, 1855. He left New York with thirty-six swarms and saved eighteen. I purchased a half interest in them. I also, in the fall of 1854, bought one swarm of Major Patrick, from which I had an increase of two.

Mr. Buck returned East immediately, and arrived in February, 1856, with forty-two swarms, of which he saved but seven. Our increase in 1856, from the twenty-eight swarms, was seventy-three. We also had about 400 pounds of honey in boxes, which we sold at from $1.50 to $2 per pound.

Mr. Wm. Briggs, of San Jose, brought out, in the spring of 1856, one swarm, from which he had an increase of seven or eight swarms the following summer.

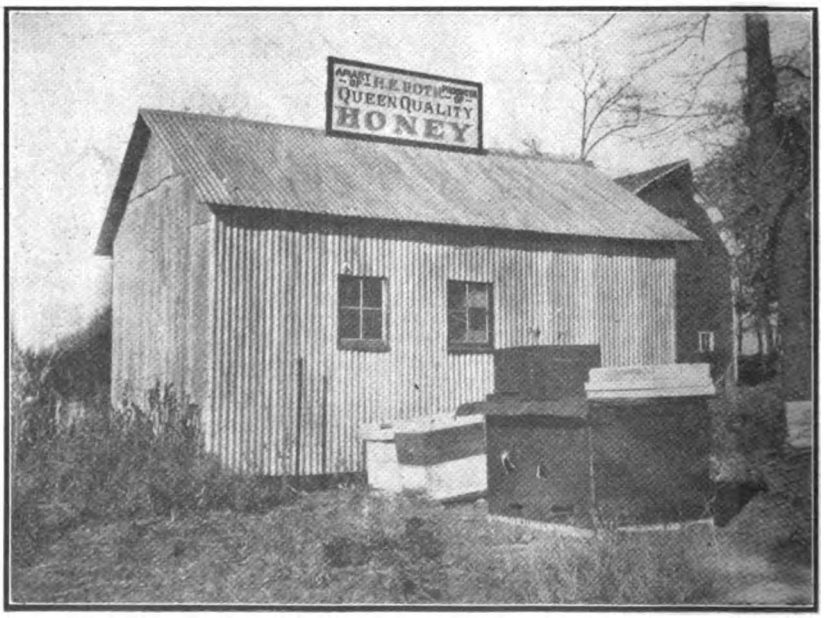
The above were the only importations I know of prior to the year (spring) 1857, which covers the ground of your inquiries.

There are in our county at this time about one thousand swarms.

Very respectfully, etc.,
F. G. APPLETON.

The first hive of bees ever in the Sacramento Valley was brought from San Jose in the summer of 1855, by Mr. A. P. Smith, the eminent nurseryman of Sacramento; they, however, soon died, which gave the impression that bees would not do well in this vicinity.

In this belief I did not concur, and



On top of the honey-house, a sign that can be seen and read for some distance

therefore took measures to test the matter further.

In the fall of 1855 I sent East and had one hive of bees brought out, which arrived in Sacramento February 1, 1856. Though most of the bees had died or escaped from the hive during the passage enough remained to prove that by careful handling they could be imported with little loss, and that they would increase and make large quantities of honey when here.

I left San Francisco May 5, 1857, on board the steamship Golden Gate, on my way east, for the purpose of preparing a stock of bees for shipping to California.

Sixty-seven colonies were prepared from my own apiaries, situated in Lawrence County, Pennsylvania.

They were taken to New York and shipped on board the steamer Northern Light, which sailed from that port November 5, bound for Aspinwall.

The bees were put on board in good order, were placed on the hurricane deck, kept well shaded and ventilated, and arrived at the latter port on the 15th of the same month, being ten days from port to port. Having arrived at Aspinwall in the forenoon, and ascertained that no passengers or freight would be sent forward before the next morning, I obtained permission to open the hives on the company's grounds, and let the bees fly during that evening, which greatly relieved them, and contributed to their health during the remainder of the voyage.

The hives were closed up and placed on board the cars, crossed safely to Panama, and re-shipped on board the steamer Sonora, which sailed from that port on the evening of the 16th, bound for San Francisco, where she arrived on the evening of the 30th.

(There were other importations of bees made during the winter of 1857 and 1858, a large proportion of which died.)

The bees had ample stores within their hives, before they started, to last them through their long journey. I neither watered nor gave them any additional food during the whole trip, except what they obtained while flying out in Aspinwall.

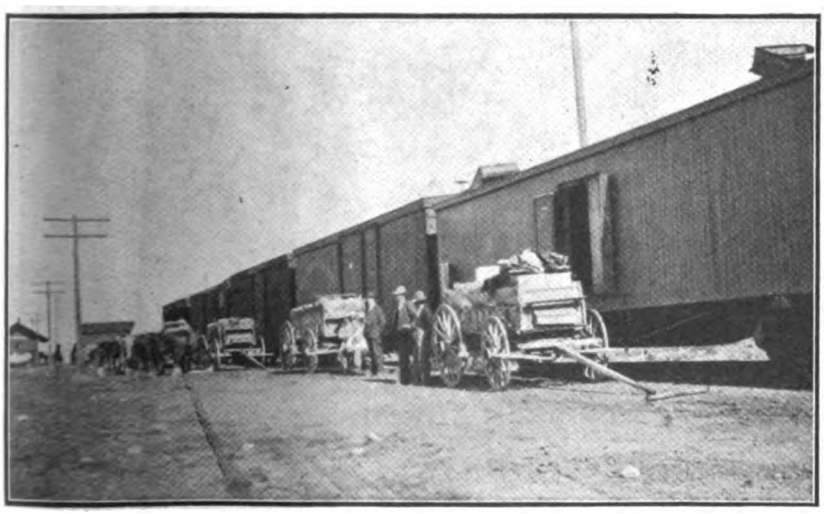
During each day's confinement the bees labored incessantly to gain their liberty, but as soon as it was dark they always became quiet, and remained so during the night.

At San Francisco the bees were transferred from the Sonora to the steamer New World, and landed in Sacramento on the morning of December 2, 1857, thus terminating a journey of 5,900 miles, which was at that time the longest distance that bees had been known to be transported at one continuous voyage.

To the officers and agents of the various transportation companies, over whose routes I passed from Newcastle, Pa., to Sacramento, Cal., particularly Mr. J. F. Joy, agent, Panama Railroad Company; Captain Tinklepaugh, of the Steamship Northern Light, and Captain Whiting, of the Sonora, I am indebted for their valuable and efficient aid in securing a safe transit, and probably the most successful shipment of bees ever made to California.

On opening the hives, I found that considerable numbers of bees had died in each, and that in five all were dead, having been destroyed by worms which had hatched on entering the warm climate, from eggs laid by the moth previous to starting. The combs were entirely enveloped in webs containing the worms, and were a perfect ruin. A few worms were found in each of the hives containing living bees, but were soon exterminated.

Some hives were found to contain so few bees that they were united with other weak ones, till the number was reduced to fifty. In the latter part of January, 1858, I made a discovery which has since been verified in a number of instances. All the bees in two hives swarmed out, leaving them entirely deserted. On examining, I found young brood; the combs were clean and healthy, and each hive contained some six or eight pounds of honey. But it was nearly all sealed up, only a few cells containing honey being open.



Loading comb honey graded by Colorado Honey Producers' rules. A typical scene of several Association cars getting ready to ship

The cause of their deserting was then a mystery, as they had apparently all the requisites to do well.

I finally suspected that, owing to their long confinement and frequent passing over the sealed surface of the comb, it had become glazed so that the bees were not aware that they possessed so ample a store.

(In the spring of 1859, and particularly the present one, 1860, I have known the bees (California raised) from a number of hives, to leave in like manner. The only difference was that the hives were not over half full of combs. But these were full of honey and tightly sealed, like those before mentioned.)

Acting from this belief, I at once, with a knife, uncapped a portion of the honey in each remaining hive. This was repeated twice a week for the two following ones, and as the honey became scarce, feed was given to the most destitute. The result was that no more hives were deserted.

There was no indication of disease of any kind existing in any of them. Hence there is no doubt of the above being a cause of bees deserting their hives. The stock was still further reduced by sale, so that thirty-four hives of bees remained on the first of April. These were increased to one hundred and twenty, most of which were sold in the summer and fall of that year.

Again, on the steamer of September 20, 1858, I returned East for the purpose of transporting another stock, which had been prepared for that purpose during the previous summer. On the 6th of December, in company with my brother, W. C. Harbison, I sailed from New York with one hundred and fourteen colonies, and arrived at Sacramento January 1, 1859, with one hundred and three living. Of this importation sixty-eight were from Centralia, Ill. The remaining forty-six were from Lawrence County, Pennsylvania.

Owing to the lateness of the season of shipping, and unfavorable weather during the first three weeks after our arival, we were only able to save sixty-two out of the whole number; these, together with the six good hives remaining from the previous year, we increased to four hundred and twenty-two colonies, including the sixty-eight old ones. Three hundred of them filled standard hives and the remainder averaged half full.

The increase was all made on the artificial principle (as laid down in this work). Not a single natural swarm issued from any hive during the whole season. I also formed a large number of colonies, for different parties in Sacramento and vicinity, which were attended with like success.

During the time between October 1, 1858, and April 1, 1859, there were shipped from New York for California, over one thousand hives of bees, not over two hundred of which survived on the 1st of May of the latter year.

All but three of the parties engaged in shipping them lost money by the operation, many of them being unacquainted with the business.

Of the modes of importing bees to California, the most novel was that of Mr. Gridley, who brought four swarms across the plains from Michigan, placed in the rear end of a spring wagon. He arrived in Sacramento on the 3rd of August, 1859, with them, in good condition. His plan was to feed them, and in addition, stop occasionally in the afternoon and allow the bees to fly out and work till dark, when they were closed up, to resume their journey on the next morning. This was repeated from time to time, as they required their liberty.

Notwithstanding such disastrous results attending the previous year's shipments, there were upwards of six thousand hives of bees imported during the winter of 1859-60. They arrived in better condition apparently than those of previous years; yet, owing to the fact that large numbers of them were infected with the disease known as foulbrood prior to their purchase and shipment, together with the effects of so long a voyage, probably one-half of the whole number were lost. Many of the remainder have since died, or now linger in a diseased condition, which is infinitely worse for the parties owning them than if all had died at once. Thus the result has been bad for all concerned; for, while some have lost their money, others have injured their reputation, besides paralyzing for a time an important branch of productive industry.—Beekeepers' Directory.

Soldering Honey Cans

By Dr. A. F. Bonney

I WAS wondering how many beekeepers understand the art of soldering tin, copper and galvanized iron, and deciding, after some thought that they are just ordinary humans, I approached some other mere men with the question. Not one man in a hundred had the least idea of how to proceed; therefore I assume that about one per cent of beekeepers understand it.

The things required are a soldering "iron," which is a chunk of copper on the end of a piece of iron rod, which, in turn, is driven into a wood handle; a bit of soldering fluid, which consists of scraps of zinc dissolved in muriatic or hydrochloric acid. Reduce to small pieces a piece of zinc sheet about 2x4 inches in size, and put it into a large-necked bottle which will hold about four fluid ounces. When ebulition ceases, fill the bottle half full of water and you have the standard flux used by tinners.

To solder galvanized iron, it sometimes becomes necessary to use the zinc and acid quite strong, or, in rare cases, full strength.

In soldering copper, pour about a teaspoonful of the flux into an earthen dish and add to it a piece of sal ammoniac about as big as a small bean. When this has dissolved it is ready to use.

Your soldering iron will require to be frequently "tinned," as some flames used in heating it destroy the surface at the point. At any time that this is required, file all four surfaces of the point. Have ready a large, flat piece of sal ammoniac and dig a shallow pocket in one side. Into this place a piece of solder and rub the hot iron into it when the tin of the solder will unite with the copper of the iron.

Another good, handy flux is a mixture of zinc chloride and vaseline. It is handy to use, as it does not spill.

Solder is a mixture of lead and tin, about half and half, and the best form to buy it in is wire, about as large as a knitting needle. There is no waste from using this form.

A surface to be soldered must be scraped clean and bright. Have the iron ready; wipe it clean with a swift rub of a damp cloth; then, holding the solder in place, touch the iron to it, when it will flow over the part to be mended. If a hole is too large to cover well, hold a dry cloth against it, inside the vessel, if you can reach it, when the solder will cover.

If, however, you have a very large hole to contend with, cut a piece of the same material you are working on. Let this be a quarter inch larger than the hole. Scrape one side, the one that is to be in contact with the dish, and also scrape the dish three-eighths of an inch around the hole, then smear on some solder. Apply the patch and lay the iron on it, when the solder will melt. You can, if you wish, solder around the edge of the patch to make sure; it will do no harm.

Buck Grove, Iowa.

Let us add that, unless the spot in the vessel to be repaired is as hot as the solder, it will be impossible to succeed in getting the solder to take hold. We found that out when we tried to solder a hole in the bottom of a large honey extractor with too small a soldering iron. If the soldering iron is large enough, it will heat the metal to which it is applied and bring it to proper temperature.

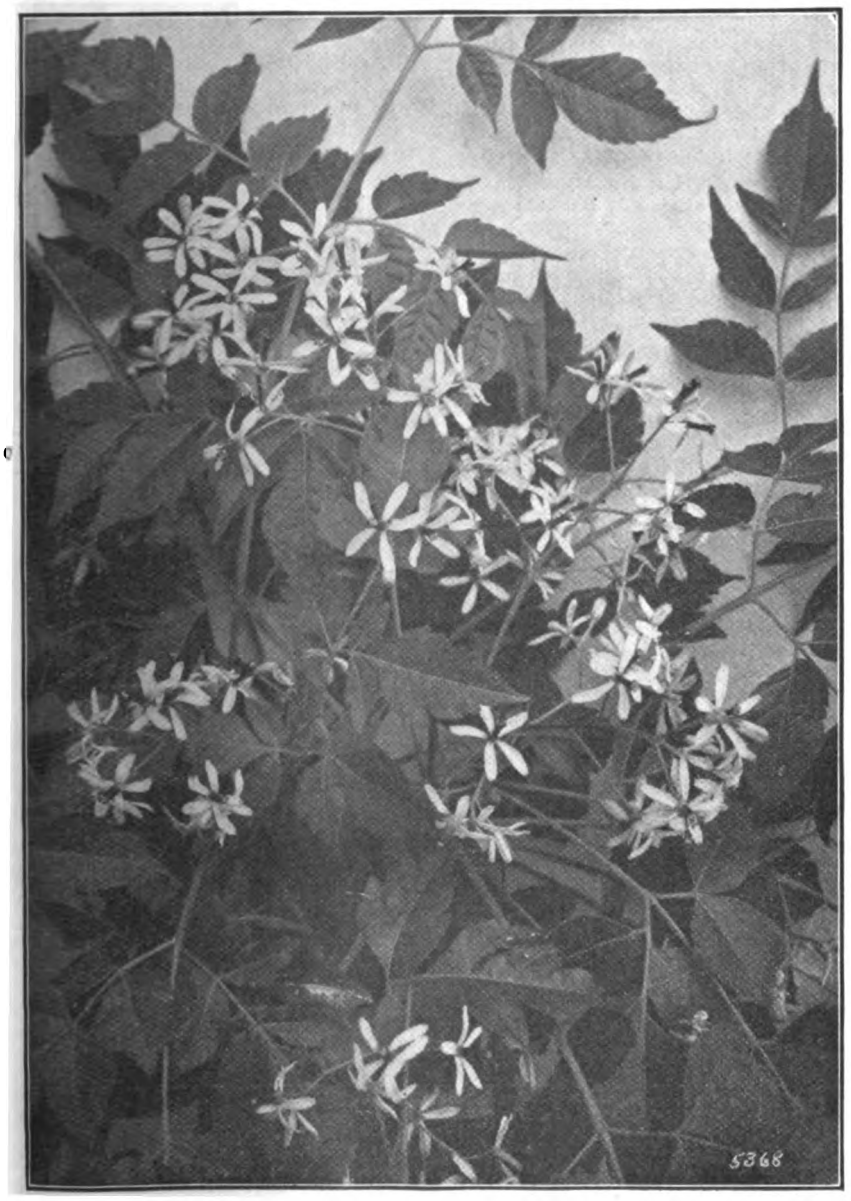
Very small leaks in honey cans, which are not discovered until after the honey is put in, may be stopped without emptying the can, by simply rubbing over the leak a small parti-

Colony of Bees in a young persimmon tree

cle of wax or paraffine containing about one-third grease or tallow, or enough to make it malleable. This trick saves a large amount of work in handling cans of honey.—Editor.

The China Tree or China Berry

THE wild China tree (**Sapindus Drummondi**), is also known as China berry, soap berry or umbrella tree. It is a very common shade tree in the southeastern States and is also found in the southwestern States to some extent. In Alabama it is a conspicuous feature of the grounds about the homes of rich and poor alike, quantities of the berries hanging after the leaves have fallen. It is cultivated to a less extent in Texas and California as an ornamental. The illustration shows blossoms and leaves. It is frequently mentioned as a honey-plant in the southern States, but is probably not sufficiently common in many places to be important.—F. C. P.



Bloom of the China-berry tree in Florida

Are Colonies Weighing Two Pounds On April 15 Profitable?

By G. C. Greiner

AT our annual beekeepers' convention in Buffalo, January 10-11, 1918, the above subject was brought up for discussion. Mr. Demuth, of Washington, D. C., said that a colony weighing less than 2⅛ pounds April 15, might better be set aside as useless; it would not pay to spend any time with it. On the other side, Mr. Hershiser claimed that very few colonies weighed over 2 pounds at that time in this locality, and yet gave big returns of surplus honey. Another well-known beekeeper of this State made the remark that he considered a two-pound colony April 15 a gold mine. This may be a little strong, but I know from many years of experience that such a colony, under favorable conditions, is a mine of greenbacks.

The difference of opinion depends altogether on locality. My whole crop comes from colonies of that description; they either weigh naturally two pounds or less, or they are made so artificially.

It is not surprising, in fact nothing else can be expected, that beekeepers living in different latitudes do not always agree on all points of bee management. They have to adapt themselves to the conditions of their own localities, honey flora and climatic conditions being the main features. Even in the same localities and under the same conditions, all beekeepers do not see things just alike, but follow different plans and methods to suit their own ideas. It is the general belief that a hive full of bees in the spring will give better results in the line of surplus honey than one of these two-pound nuclei. I believe the same, but divide them.

Some time ago, at a social bee-talk with a prominent neighboring beekeeper, our conversation drifted to spring management. He objected to my method on the ground that his undivided colonies had more bees when the honeyflow came than my divided ones. Of course I agreed with him, but he was no little surprised when I explained that that was what I was trying to prevent. A large percentage of his bees are old, wornout fieldworkers that have outlived their usefulness as honey gatherers and exerting their last vitality with making preparations for swarming, while my bees, although fewer in number, are nearly all young, energetic workers, doing their level best at storing honey. It is the old stock that is bent on swarming; young worker-bees, the same as young queens, are less inclined that way. Consequently, I have practically no swarming, while he has to spend his time taking care of young swarms.

All beekeepers, especially comb-honey producers, know full well what a discouraging sight presents itself when a colony with one or more supers of partially finished sections on the hive sends out a swarm. Hive and supers are deserted by their working forces and all business is at a standstill. Treat them as we may; cut out the queen-cells and return the young swarm, hive them on the Heddon plan, or hive them on starters, foundation or empty combs, it is all the same; a certain time will elapse before they are sufficiently organized again to take up their super work, and by that time the best of the honeyflow may have passed.

The most convincing proof that colonies weighing considerably less than two pounds even as late as May 25, can be made profitable, is plainly demonstrated by the experience I had last spring. Early in the season I ordered, as a trial experiment, two 2-pound packages of bees with Italian queens, from the South, to be mailed May 10. But the breeders were crowded with orders and could not ship the bees until the 21st, arriving at my place May 25. About one-half of the bees in one package and one-third in the other were dead. The queen of the former proved to be all

right. She began to lay soon after she was released, but the other was no good; she never laid an egg. She remained in the hive one week and then disappeared, making the introduction of another queen necessary.

With the exception of a little patch of brood the size of a double hand, which I had given them when making the transfer from the shipping cage to the hive, neither had any outside help except an additional empty comb whenever they needed one. During the white clover flow both queens built up their colonies at an astonishing rate and by the middle of July the first one, that had lost the most bees, was ready for the super. The other, on account of the poor queen at the beginning, was a little slower in building up, but both colonies did remarkably well. Being so late in the season, I did not expect that either could possibly fill more than one half-story super, but to my surprise they even filled a second and the better one of the two a third one. I extracted about 90 pounds from the one and 60 pounds from the other.

This is not a very big yield, but we must bear in mind that both colonies grew from a little bunch of bees weighing only two pounds each when mailed from the South May 21, and both had unfavorable conditions to contend with—one by the loss of many bees and the other by having a worthless queen. Under more favorable conditions they would have done much better. At all events, the experiment proves that combless packages of bees shipped from the South by parcels post are not questionable undertakings. Under common conditions it is perfectly practicable to replenish depopulated beeyards in our northern latitude in this way and harvest a fair crop of honey the same season.

La Salle, N. Y.

Please Date Your Articles

WILL my fellow beekeepers please date their articles in the American Bee Journal? On page 405, December number, under the title "California Weather and Prospects," the writer says "this is Columbus Day." While this may be very instructive to the people of the United States, it is not of much use to people in other parts of the globe. Then some person comes along and says, "Now the maple is budding, etc., etc.," which no dobut explains the period of the year to those "in the know,' but is no guide to me. Why cannot they give the exact date? Then others would get some idea at what periods their seasons begin and end. Another rotten habit they have (and it is, I think, peculiar to the United States people) is to talk of five-penny nails and ten-penny nails, etc., etc. I have not the faintest idea whether these are 1x18 or 4x¼. If they would refer to the nails by size. as I have done every one would know what they meant. Nails here go by size, and I suppose they do with you, commercially. Two by ten means a nail 2 inches long by one-tenth thick, and so on all through the sizes. If one speaks of 1¼x17 he knows it means 1¼ inches long by one seventeenth inch thick, or a thin, small nail for frame nailing.

We are having a rotten season here. My western farms have so far given nothing and the season there will end in four weeks, although here it may go on for four months. We have done fairly well here and hope to get a fair crop before the season ends.

On page 406, American Bee Journal, you mention paralysis, or a resemblance to it, in Mr. Carr's apiary and also in yours. I had exactly the same thing in one of my apiaries at Glenbrook, on the Blue Mountains, but only in about 25 per cent of the hives. The ground in front was covered with bees crawling about unable to fly, and they had crawled up on stones and sticks in small bunches. Very few of the bees died and these conditions only prevailed for a few days. Apparently they all recovered and regained the hives. The weather was excessively hot and dry, being just before Christmas, and no flow on. One of my neighbors complained that the bees had taken charge of her preserving room and had sucked all the juice out of the fruit she was preserving. Looks as though my bees were intoxicated; were yours and Mr. Carr's?

MAJOR SHALLARD.

I. Woodburn, N. S. W., Australia.
March 2, 1919.

Major Shallard is right. We should date our articles. In the case mentioned the fault is probably with the management of the Journal. We can readily understand that people living at the antipodes, as far south of the equator as we are north of it, and whose summer is our winter, should be anxious—when they take the pains of reading beekeeping news from so far away—to know at what dates the crops reported are harvested. We must try to bear this in mind. It will be useful to our own people.

As to the naming of nails "five-penny" or "ten-penny," this is a distinctive United States classification, owing, they say, to the fact that a hundred such nails used to cost five or ten pennies, as the case might be. But if we must resort to less antiquated names, we should certainly use the most progressive, those of the metric system, instead of using inches, feet, ells, yards, rods, chains, etc. It is true that many people do not realize how exceedingly simple and convenient the metric system is. Our scientists use it, in spite of the popular prejudice against it. But as advanced a magazine as the Literary Digest sees fit to sustain the old system, by publishing (March 15, 1919) a map of the world showing China and Russia, and other backward countries, on a par with the British Empire and the United States in a continuation of old systems. We would be equally ridiculous if we were to argue in favor of the old gum or the straw skep as against the modern movable-frame hives, on the plea that the former were still the more widespread over the world.

We should certainly be proud that wide-awake men like Major Shallard, living as far off as Australia, should take enough interest in our contributors to wish to know the time of their honey harvests.—C. P. D.

Policy and Aims of the National Beekeepers' Association

By Chas. B. Justice,

IF the writer properly understands the object of the National Beekeepers' Association, it is that it may become an affiliation of all State, County or District co-operative marketing honey exchanges and associations throughout the United States, but that the affiliation shall have only regulatory powers. In other words, each district or state exchange of association will handle its own business as a complete entity within itself, and it should be incorporated on a firm contract holding its members together and developing the standards of quality, grading, manner of packing and selling of its products, and its membership in the National Beekeepers' Association should be by delegate properly accredited with the power and authority of the exchange or association sending such delegate, with the idea that the combined strength of all the State or district exchanges supporting the membership of the National would be sufficient to bring success to its efforts and determinations. It is hoped, therefore, that the National Beekeepers' Association might become famous in its worthiness for this name, for its higher services to the beekeepers in a national way, for its truly broad conception of the possibilities of the honey industry, and for its practical endeavors to attain a higher position for beekeeping among the industries, for its success in hastening the time of a more universal consumption of honey on the table everywhere, for having secured recognition of the importance of the industry by all national and state governments and actual assistance from the same through education, appropriations for extension work, and wise laws protecting the purity of our food and safeguarding the beekeeper in his work of production.

At the 49th annual convention of the National Beekeepers' Association, held in Chicago on February 19, the following resolution was adopted:

"Whereas, Your committee appointed yesterday under a resolution authorizing its appointment for the purpose of formulating and reporting a plan for the organization of beekeepers, realizing that the basis of such organization must be laid in the minds and hearts of the beekeepers themselves and must find its approval with them, respectfully recommend that a convention be called sufficiently representative in character to give weight to and command respect of its determinations; to that end be it

Resolved, That the Secretary of this Association be directed to invite representatives of all organizations of beekeepers, teachers of beekeeping

and members of the allied trades to meet at Kansas City, Mo., in January, 1920, for the purpose of formulating and adopting a plan and constitution for a National Association."

E. S. MILLER,
COLIN P. CAMPBELL,
CHAS. B. JUSTICE,
WESLEY FOSTER,
Committee.

Our first duty appears to be that of encouraging each district where honey is produced to organize their local members into strong marketing associations or exchanges, and to all such the writer fortunately is able to explain fully the workings of the California Honey Producers' Co-operative Exchange, a successful marketing association, whose members own or control in excess of 100,000 colonies of bees. He will take unusual interest in pointing the way to all prospective organizations, and will immediately furnish copies of the California Honey Exchange contract, by-laws and other data to all who inquire for same. He suggests that all societies now organized for other than marketing purposes endeavor to find a common ground and incorporate for marketing purposes as well. The benefits derived from the purchase of supplies alone will far exceed any cost of organization, and though the members may dispose of most of their honey locally, even selling it out themselves in a small way if preferred, the possible surplus will be taken care of by the exchange, and we are sure that they can arrange to keep their expenses within bounds; and it won't be long before the old custom of local selling in small quantities, with its attendant (though uncalculated) costs of time and effort, will give way to the new and more up-to-date commercial method of wholesale distribution, leaving the beekeeper wholly free for production, which is his specialty. The supply manufacturers welcome the greater volume of business procurable by them through the increased prosperity of the organized beekeeper. The California Honey-Exchange turned over business approaching $15,000 to one supply dealer alone during the past few months.

At first thought the beekeepers are inclined to believe that the independent operators are opposed to organization among the beekeepers. This is a mistake. All legitimate dealers and handlers of honey everywhere welcome co-operation among the producers, as its first achievement is to grade the honey and put it in a better container and to keep the junk honey off the market. The California independent honey dealers have welcomed the California Exchange, admitting that the Exchange over night revolutionized the package, something the operators had striven for without success for ten years past.

To all the officials of all societies, exchanges and associations throughout the United States, as well as independent beekeepers located in districts where 1,000 colonies of bees or more may be organized into one exchange, the writer suggests that you write to him if he can render service in explaining the benefits, conveniences and satisfaction of organization among beekeepers.

318 L. A. Investment Bldg.,
Los Angeles, Calif.

Controlled Mating—The Value of the Sire in Pedigree Breeding

By D. M. Macdonald

"THE old order changeth, giving place to new."

I have lately been seeing visions of future developments in the apiculture of the world. A beekeepers' paradise opens up before me as to the future which may be revealed to the eyes of the younger members of the craft. What led up to my dreams was a series of remarkable prices obtained for Polled and Shorthorn young bulls of the choicest strains. All around me, in the north-eastern counties of Scotland our farmers are at the top in regard to the possession of champions of both herds. At the recent annual sales young sires, not yet a year old, were disposed of at figures almost startling in these war times. One hundred pounds up to 900 pounds were quite common figures, and for the "plums" of the choice herds from one thousand to four thousand pounds was not uncommon. Blood tells, and these fancy prices were the result of "blue" blood, and careful breeding.

My aspiration is that a combination of queen-breeders will seek to emulate the doughty deeds of these cattle-breeders, and evolve a race of bees, or a strain of one or another of the best races, that will prove their breeding by results in their way as marvelous as these young sires of high pedigree. Who are prepared to center this union, and so prove themselves benefactors in beedom? Here in this country we work on too limited a scale, and continue so short a time absorbed in the pursuit, carrying it on as an avocation and not as a vo-cation, that little can be done in working for progress. Therefore, if at all, the duty of improving must be undertaken in America. You in the United States carry on the industry on such an extensive scale, your varied climate is so suitable all the year around for queen-breeding, and so many firms already devote considerable energy to breeding, mating and improving that there is a substantial foundation for future advance, on which the superstructure may be erected.

It may require Government aid to launch such a scheme on anything like an extensive scale all along the line, but there should be no difficulty in securing a grant in so democratic a republic, if the necessity for such a proposal is convincingly submitted to the powers that be. The present government apiary at Washington, working in unison with the already established firms turning out queens, all acting on well established formula in regard to breeding, could form the nucleus on which to build the complete structure working all over the Union, from the Atlantic to the Pacific and from Canada to Mexico—or, indeed, over the whole continent.

There can be no hesitation in the mind of any beeman to ascribe a very large share of our success in apiculture to the queens heading each stock, and the surplus taken of colonies, apiaries, States and the Union as a whole hinge on the question of breeding prolific mothers.

The proof of the pudding is the eating of it.

An enhanced price would be gladly paid, as it would mean that for a comparatively small initial outlay more bees, more honey and more money would be obtained, while the pleasure of working with such prolific mothers would give a new zest to the pursuit. Better queens will make better bees, better honey, better returns. Quantitively and qualitatively there is bound to be an improvement.

Is all this only a dream? Nay, verily! The design, the process, the evolution is only what has been going on steadily for many years in the Polled and Shorthorn herds alluded to above, whereby they have been improved by breeding and careful selection on well-marked lines until they have attained to such a state of perfection that they sell readily at the high prices—ten times the maximum obtained in my early days. It must be granted that man has more control over animals than over insects, but the rate of increase is in favor of the latter during a full year. Breeding with care and with intelligent selection has found to work wonders with bees, where the process has gone on for a long enough time. As a proof, witness what has been done in producing "All Goldens," "Three-banders" and "Five-banders." Color breeding to produce **the best** bee is a myth, a delusion and a snare. A beautiful exterior may produce softness, want of energy and a short life. I hope the splendid experiments recorded in last year's Gleanings have testified that improvement can be produced by pure mating. That would be a gulf bridged over, and this attained the whole system would be shunted on to the main line, instead of having a number of small trains running along on tiny branch lines, all leading along either parallel tracks or leading away in contrary directions—which is a simile comparable to the present system, or rather want of system, where isolated breeders work at present each for his own hand.

In every other walk of life the sire is the one who leaves the chief impress on the future generations. Pedigree in the sire enables the breeder to climb steadily up the rungs of the ladder of improvement. This is only asserting a well-known truth. The semen conveyed by the drone to the queen on her mating trip has an influence for good or evil on every egg the queen lays during her long or short life. A weak drone imparts the elements of weakness to his progeny. Drones must therefore be carefully bred, and if a test can be agreed upon only the strongest and most virile should be allowed to engage in the race for mating. Nature has provided an admirable test, but

man can still further winnow out the weaklings and put more strenuous tests still in the path of these marital warriors. I know, of course, that American breeders work and have worked for betterment, but that is not the point I am aiming at. Each now follows his own devices and works only on his own initiative. There is no concerted plan, union or combination. Each breeder now has his own aims, aspirations and deals. I would have the entire body act as one on well-thought-out lines, applying their abilities and energies on a systematic plan laid down annually by a breeders' conference. A later article will seek to demonstrate how this can be done.

Banff, Scotland.

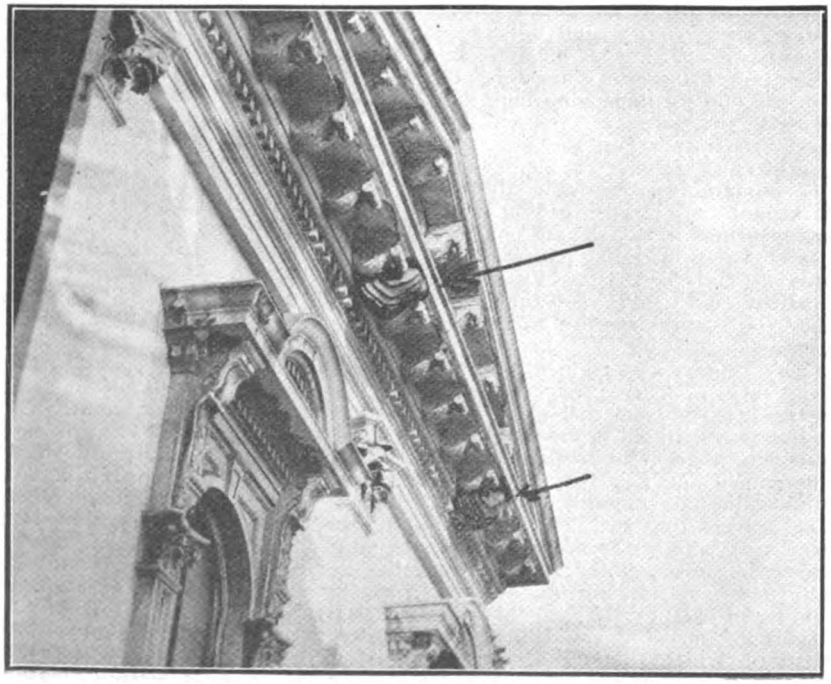
Hiveless Bees

HANGING under the cornice of the court house at Visalia, Calif., are two big colonies of bees. The one came as a stray swarm several years ago and settled in an inaccessible position under the cornice. After a year or two of comb-building a swarm issued and settled in a similar position something like twenty feet away. The bees have been there several years, and from the size of the clusters to be seen from the ground below they must be very strong colonies. In the mild climate of California they do not apparently suffer any inconvenience from the exposure to the weather of winter.

During the short course at Visalia last winter these bees were the source of much curiosity on the part of visiting beekeepers. Hanging about 40 feet above ground it was impossible to get a very close view. One afternoon the sessions were adjourned to give everybody a chance to have a try at photographing the bees in their unique position. There is a large tree standing about 20 or 30 feet from the building. It seemed as though the top of the tree should furnish an ideal place to get the desired picture. Jay Smith was the most venturesome photographer in the crowd and with the help of the city fire department with their long ladders he was able to get a big start toward the top. However, in spite of the lift, he still had a hard climb to get into the desired position.

The two pictures shown herewith were taken by our associate editor from a second story of the building. One shows the combs under the cornice and the other a group of beekeepers at the foot of the tree who were watching Smith in his efforts to get a better position.

With the crowd of beekeepers standing around, the fire department with their ladders and the groups of people at the various windows, passersby were very curious as to the cause of so much commotion when no smoke was to be seen.



Two swarms of bees in the court house cornice at Visalia, California

Twin Hives and Others

By Arthur C. Miller

THE twin hive plan suggested by Mr. Sladen in the American Bee Journal for April will doubtless attract much attention from the younger beekeepers, and some of the things he suggests that it may accomplish will probably be noticed by the older boys, but the plan is not new nor is it a panacea for beekeeping ills.

Away back in the early eighties, Prof. N. W. McLain, at Aurora, Ill., made and used a lot of such hives, and at the start he was very enthusiastic about them. I saw them in operation, listened to his explanations and later experimented with the principle, but it was disappointing, and like so many other hive schemes, it called for that most expensive item in honey production, "manipulation," in other words, "labor."

The "Long Idea" hive now receiving some attention was exploited by Gen. D. L. Adair in the early seventies and was designed primarily to avoid the necessity of lifting supers when it was necessary to get at the brood-nest. So good a beekeeper as the late O. O. Poppleton used many of them. They do avoid the lifting of supers, but the hives themselves are great, unwieldy things and possess the undesirable features mentioned by the editor.

Mr. Allen Latham took the "Long Idea" hive, put the entrance at one end instead of at the side, confided the queen to some frames at the entrance end, by means of a partition of excluder metal, and called it a "Let Alone" hive. He operated it on a minimum of attention plan, and in his hands it was successful until diseases invaded his yards, and I believe he is not now making any new ones of that type.

Hives have been devised to force bees to do certain desired things, hives for contracting, for expanding, for inversion, for all sorts of protection and all sorts of ventilation, for side storage and top storage, tall narrow hives, short broad hives, round and square and triangular; telescope joints, flat joints, beveled joints, entrances too varied to enumerate, until one wonders if it is possible to conceive anything new.

Just about two styles or sizes of hives remain with us after thirty odd years of use, the much-pushed Langstroth and the Quinby. There are variations of both, eight, ten and more frames of Langstroth and the same of Quinby. In judging the value of styles and sizes of hives, by their seeming popularity, one must be careful to consider why one or the other is mostly in use, whether it is due to intrinsic merit or to advertising. The Quinby hive has held its own unpushed through these many years, and now that its users are making themselves heard its use is spreading. (The "Jumbo" is for all practical purposes the Quinby, with the advantage of being an article "stocked" by the supply manufacturers). The Langstroth has never been stable, every few years seeing some variation, and now the press is filled with urgings for a two-story ten-frame Langstroth hive for constant use. This is better than any new type of hive, less costly to the beekeeper, but it is far from as cheap as a single-story deep hive. It is more expensive in first cost and more costly in operation and upkeep.

The two-story hive propaganda may "listen good" to the manufacturers with bodies selling at $1.06 each and frames at $6.50 per hundred and foundation at 85 cents per pound, but the honey producers must look out for their own interests, too. They must consider first costs and also operative costs. These things matter little to the back-yard beekeeper, but to the would-be professional they mean a lot. He must look sharply at the size of his invested capital with its resulting interest and depreciation charges, and he must also consider the labor cost in handling his hives. It makes a

vast difference whether he can alone handle 500 or 1,000 colonies or must hire costly help.

It is obvious that the single-story deep Quinby or Jumbo hive is superior in all these things to the two-story hives.

Unfortunately for the craft, very many of the innovations in apiary appliances have been the result of enthusiasm, plus good propaganda, plus commercial possibilities. To prove this one only needs to follow through the bee press the growth and development of the sundry things now in use, and others once popular but now long forgotten.

All too often the sincere and honest inventor or designer was not a close observer and the deductions from such facts as were observed were erroneous. Examples of the statements in both of these paragraphs can be found all about us, but it is needless to cite them here.

During the past few years Dr. Phillips and Mr. Demuth have done much original work on the habits (behavior) of bees and their relation to practical bee culture and we already have beneficial results in their application to the wintering problem.

In his day Mr. Quinby was probably the closest observer and the soundest in his deductions of anyone. The conclusions he reached in hive proportions and sizes have proved sound for over fifty years. And the users and advocates of the Langstroth hive are beautifully proving for us that it is not right in proportion or size.

It is well that hives should receive our careful consideration, but before we go to inventing new ones let us see if they are new, and before we revive old ones let us see why they were discarded. They may have had merit and needed only a better understanding of bee behavior in using them. And before we ask the editors to consider reams of manuscript, and use up pages of costly space in their papers, let us each inform ourselves of what has gone before, both in mechanical appliances and in operative practices. Our old and tried things may be good enough, but our practices may not be right, perhaps based on mistaken ideas of bee behavior or from wrong deductions from observed facts. Some of us may have to depend on others for the careful observation and the accurate deductions and some of us may have to depend on others for the history and the editors are often too busy to dig it out, so we must all help.

Providence, R. I.

Honey Storage

Mr. Morley Pettit:

Dear Sir—I am obliged to put in a settling tank system, and as I understand your new central plant is thus equipped, I would be obliged if you would tell me the size of tank you use, the material out of which it is made and whether you have it above the extractor and pump up the honey, or whether it is below the extractor, so that you have to hoist the honey from the basement after it is put up in containers. I hope you can give me the above information, and also the number of seasons in use and the drawbacks you have found so far. Also, if tanks are made of galvanized iron, give the gauge.

Ontario.

Our storage tanks for honey are 33 inches in diameter and almost 5 feet high—as high as two sheets of galvanized iron would make them. The diameter was determined by the width of ordinary doors through which they might have to be taken. The iron is gauge 24 or 22, I am not sure which. The first one was made of 26 gauge iron, and was considered too light, although it is still doing duty. Each has a close-fitting lid of the same material, and a good large gate of the most approved type, opening directly upward and not turning on a side pivot as the cheaper ones do. I refer to the ones used on extractors, which are all right for size, but are not at all satisfactory for controlling the stream from a tank holding nearly two thousand five hundred pounds of honey as these do.

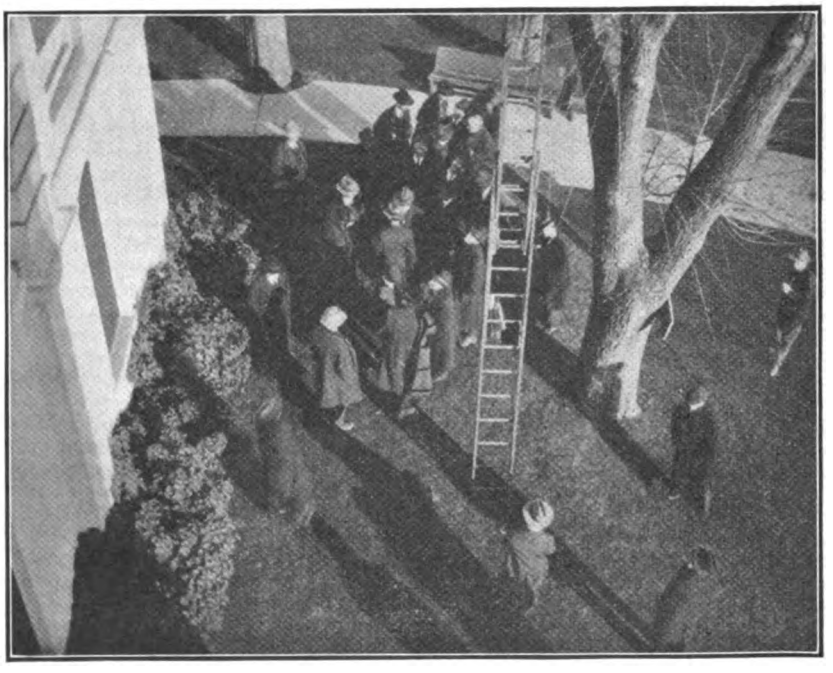
We consider it requires at least three days in ordinary summer weather for the honey to settle satisfactorily, so you should have enough of these tanks for at least three days' extracting. Against the partition which separates the honey room from the extracting room we have built a bench 3 feet 3 inches high for a row of tanks. This leaves just enough space between their tops and the ceiling for a man on a step-ladder to lean over and skim them. Then, for filling, the scales are set on a table at which the operator can sit in comfort without stooping to the floor, as would be necessary were the gates lower down. The honey pipe from the pump rises to the ceiling in the extracting room, goes through the wall and delivers the honey over the top of the tank. It is galvanized iron gas pipe, 1 inch diameter, with rubber hose on the end for changing from one tank to another.

By the arrangement described above as compared with gravity delivery from extractor to store tanks we save much tiresome lifting, and stair-climbing, at a slight expense of engine power. I think it was in 1913 we started using the pump and gravity clarifying. We used the large tanks exclusively first in 1916. The pump hastens granulation, and if allowed to run without enough honey to exclude air will churn the honey; but this is easily regulated. Gravity clarifying is not sufficient for honey which is to be sold liquid in glass; but for bottling it should be heated and is easily strained in connection with that operation. The large tanks as described are an unqualified success, so far as we can see at present, and extracting, as we do, all at the home place. MORLEY PETTIT.

Ventilation of Hives

I am building my own hives and supers, but buy factory-made Hoffman self-spacing frames 19⅞ in. top-bars. The hive-bodies I build are 2½ inches longer on the inside than the frames, in order to give me space for double walls at both ends of the hive. I have a half-inch air space from the outside end walls and then nail a half-inch thick board for support to lay the frames on. Both these inner walls are raised 1 inch from the bottom-board for letting the air pass to and from the hive. Both outside end walls have one inch hole bored in the center and these holes are covered inside with wire screening to keep robber bees from entering the hive. These holes are also handy for lifting the hives.

The idea is that when a cold wind strikes the hives (I face all my hives south), it cannot penetrate directly



Group of beekeepers watching photographers in their efforts to get pictures of the bees

into the broodnest, but the air, on striking the inner wall through the 1-inch hole in the outer wall is compelled to go either upward between the ends of frame or is forced downward through the 1-inch opening near the bottom-board into the hive.

On chilly days in spring or fall I close either one or both holes with corks, according to the temperature outside.

Spring robbing can thus be prevented by reducing the entrance so that only two bees can pass, as one can depend on the end ventilation.

I have had great loss in cellar wintering with sealed covers with no other ventilation than the entrance; the hives being icy in frosty weather and wet in milder weather, the result was many dead bees, moldy combs and sour honey. Since I adopted the end ventilation, which I can regulate with corks, I found that my hives kept dry with no moldy combs in spring. I had the entrance opening reduced to 7/8x1 inch with no detriment to the bees.

If my system finds the approval of Dr. Miller and the editor of the American Bee Journal, I intend to build hives with inner walls and ventilation holes on all four sides. Were it not for the dying bees in cellar the entrance could be blocked up entirely on such hives and bees could be kept in a lighted cellar.

An idea is revolving in my mind to build a square hive which will hold 13 Hoffman frames, 19⅛ in. top-bar, and in which the frames could be placed either crosswise or lengthwise. Such hive could be placed crosswise on the bottom-board in winter cellaring to keep the bees from direct striking of the cold air from the entrance. We find that bees usually cluster in the front of hive and above the entrance to avoid the direct draught of cold air which first rushes to the rear wall before it divides upward; hence the rear part of the hive must be colder than the front.

Of course, all my hive parts being interchangeable, I transfer all my bees in the spring to different hive-bodies, that is, I take an extra hive-body which was standing idle during the winter, scour and clean it, take comb after comb with bees out, scrape off propolis, brace and burr-comb, and set the frames and bees in the cleansed hive. The bees which hung on the old hive are brushed off in front of the new hive. In doing this performance one can find out the condition of combs, bees, honey, brood, and even see the queen by chance. Then I clean the hive I took from the first colony and proceed with the second colony in the same manner as with the first. On a sunny and warm day a man can clean and transfer twenty colonies, and one will be surprised to see and hear how comfortable the bees feel in the cleansed hive. We are saving the bees a great deal of extra work, and, besides, prolonging their lives, which means more rearing of brood.

I must mention that one must be on the alert that no disease is prevalent in his bee-yard in order to go into such procedure of spring cleansing.

Now I want Dr. Miller to make opposing suggestions to my ideas, as I am a beginner in beekeeping and would like to hear also from experienced beekeepers, if they have any criticism against my method of building hives.

Minnesota.

I would strongly advise that you try your plan with only a few hives—perhaps only a single hive—for some time before making all your hives in any new way. One reason is that if you continue in the business many years you may want to sell some of your stock, and bees in odd hives do not have a ready market. Another reason is that only after a full trial can you tell whether what looks like an improvement is really so.

You intend a kindness to the bees by making the entrance indirect, so that robbers cannot easily enter. I fancy I hear the bees saying, "Please don't do that. Anything of that kind doesn't really make any difference to the robbers, because a strong colony, such as we are, can easily keep out robbers, but it does make a difference to us, giving us a little more trouble to pass in and out, and if you figure up how many times that happens you will see it is quite important."

The Langstroth hive was originally made with a portico, but this was later discarded because it made a nice refuge for spiders. Your arrangement may suit the spiders still better than the portico.

Opening and shutting of holes with each change of weather will probably be found too troublesome to be continued.

If your hives are icy in the cellar, no change in construction will remedy the trouble, but some means should be used to make the cellar warmer.—C. C. M.

(We used to close inch holes with wire screen also, but found out that the bees glue them up entirely with propolis and that they usually do so with any opening through which they cannot pass. Examine the inch holes that you have covered with screens, and see whether they are not already partly closed.—C. P. D.)

Moths

I see that Dr. Miller, in his reply to "Missouri," page 202, is rather inclined to be a little skeptical as to there being moth worms that will withstand freezing. But I can assure the Doctor that there is a species of the bee-moth whose larva will survive even frost, whether they be "right-minded" or not.

The worm is small, being from one-half to five-eighths in. long, and from one-eighth to three-sixteenths in. in diameter, and it is a pinkish color.

It was in the summer of 1914 that I was infested with this plague. I had a lot of supers that were not in use that year, and those worms got into them. They cover the face of the comb with a web, which is quite easily brushed off with a whisk broom. They did not do the combs much damage that summer, but worked chiefly upon the pollen that was stored in them. So I didn't pay much attention to them that season. I was positive in my own mind that I would be rid of them the following spring. So in the month of May the next spring, when I wanted some supers to put on some strong colonies, I thought to put on some of the supers with the worms in them, and let the bees clean them up.

Now those supers were stored in the loft of the honey-house, where the temperature goes to at least 20 degrees below zero. You can imagine my surprise when I examined those combs and found live worms. I was at a loss to know whether those worms were hatched from eggs that spring, or did they survive the frost? But I was rather inclined to the latter opinion. I tried to get rid of them by fumigating with sulphur and disulphide carbon, but both failed to destroy the worms. So I was at a loss to know what to do with them. However, I worked away with them that summer, brushing them off occasionally and re-opening them down as best I could. But in spite of all I did they destroyed quite a number of my combs, as they ate up the comb after the supply of pollen gave out. As I was not positive that those worms did lie in a dormant condition during the winter, I decided to make an early examination the next spring, so as to be sure. So acordingly the first week in April, after a few warm days (while the snowbanks were yet in the corners of the fences) I made an examination, and I found the worms were alive and ready for action.

Now, those worms were not in cocoons, but on the face of the combs right where they were when the cold weather stopped them, but as soon as they were thawed out they were ready to go to work.

So, when I failed to get rid of the worms by freezing, and with sulphur and sulphide, I decided to try starvation; accordingly I rid my honey-house of all combs and got them all into use, and in this way I got rid of the worms and have not been troubled with them since; that was in 1916. If I am ever troubled with them again I will send Dr. Miller a sample of them for him to experiment with. I might say that I think had I used the disulphide carbon strong enough it would have been effective. A. M. BRIDGE.

Ontario.

This seems to be something entirely new. I have never seen but two kinds of wax-moth, beside the common one, the little fellow that seems to stay at the septum. Of this latter I have seen but a few examples. You will not see the worm on the surface, but will see two or three mature bees in adjacent cells apparently trying to get out of their cells and unable to do so. Then, when you pull out the bees you will find the little miscreant at the bottom of the cells, holding the bees there by its web.

I hope this non-freezable variety will not become common.—C. C. Miller.

DR. MILLER'S ANSWERS

Send Questions either to the office of the American Bee Journal or direct to DR. C. C. MILLER, MARENGO, ILL.. He does NOT answer bee-keeping questions by mail.

Queen Excluder—Two or Three Eggs in One Cell

On May 17 I put an extracting super with four drawn combs and four frames with foundation over wire excluder, on what I thought my best colony.

May 18 bees had taken possession of super.

May 19 I found one comb, a drawn comb filled with eggs—two and three eggs in the same cell—yet hardly any cell skipped. Surely a fertile worker at her business, and a queenless colony, I thought, and the colony must be broken up. Yesterday, May 21, I examined the brood-chamber. I found it full of worker bee-brood, a drone-cell here and there, eight of the ten frames covered with bees—no queen, however, to be found. I was mystified for a while. Then I took out that comb of the extracting super—and here along comes the queen, and very unconcerned, indeed.

The wire excluder shows no apparent defect. I removed the excluder to allow the queen to go to the brood-chamber unhampered—which she did almost at once. I put the super on without excluder, thinking what the queen did once she might do again, and in her efforts to get through the excluder harm may come to her.

1. What shall I do in regard to that super?
2. Shall I forgive the queen this time?
3. Why did the queen lay several eggs in the same cell?

An answer through the American Bee Journal will be appreciated. MINNESOTA.

ANSWERS.—1. A little hard to say. The question arises whether the queen was at fault or the excluder. It may be that there was some defective spot in the excluder through which the queen might pass, although close examination might not discover it, in which case if you should return the super over the excluder, the queen might happen not to hit the same spot again. On the other hand, the excluder might have been perfect and the queen might have an undersized thorax, in which case she would be pretty certain to go through the excluder again. Two eggs in a cell, while there were no doubt plenty of empty cells, is somewhat against her, although I have known queens that for a time did bad work in having a plurality of eggs in a cell, and afterward conducted themselves with entire propriety. But another count against her is that in the sample which you sent at least two eggs are on the sides of the cells, one of them being clear out of the mouth of the cell. If she keeps up too much of that sort of thing, she can hardly be forgiven.

3. I do not know. As I have already said, a good queen may sometimes do this for a time, but if she does much of it, and especially if she does not lay eggs in the bottom of the cell, I would fear she is a bad queen, without being able to say exactly why she does such things.

Setting Swarms—Queen Excluders, Etc.

1. On the front page of the American Bee Journal are the pictures of two men, one is that of Rev. Langstroth, the inventor of the movable-frame hive; who is the other?

2. On page 24 of the American Bee Journal of January, 1918, "Virginian" takes issue with Mr. Frank C. Pellett concerning the custom of some people making a noise when the bees swarm in order to get them to settle. Last season I had my bees under a big Chinaberry tree and a swarm settled on one of its branches about 10 feet from the ground. I shook them down 3 or 4 times after placing a hive under the spot where they were settled, but the bees always took wing and returned to the same branch. Then my wife took an old cow-bell and went to a nearby peach tree and rang it while I vehemently and continuously shook the branch, and the bees promptly settled on that peach tree, and were hived without further trouble. What is your opinion of this matter?

3. Is it possible for a virgin queen to go through a queen-excluder TEXAS.

ANSWERS.—1. It is Charles Dadant, the father of C. P. Dadant, one of the ablest bee-keepers of a former generation, who probably did more than any other man to popularize movable-comb hives in France, where he was better known than in America where he lived.

2. Are you sure it was a fair thing for you to butt in and not let the cowbell have a chance to do its work alone? Seriously, there is no certainty at all that the cowbell had anything to do with it,and at that moment it is just possible that the bees took it into their heads that they would change their location, cowbell or no cowbell.

3. Yes, such things have happened, either because the excluder was faulty or because the queen was abnormally small. But I suppose the same queen would go through just as well after becoming a laying queen. The abdomen of a laying queen is much larger than the abdomen of a virgin. It is not the abdomen, but the thorax that prevents the queen going through the excluder, and I think the thorax of a laying queen is no larger than it was while she was a virgin.

Feeding—Robbing

1. If bees have plenty of stores, would feeding stimulate brood-rearing?

2. Suggest a way of keeping combs of honey and empty combs free of moths. If they are placed in a vessel that a bee-moth can't enter, will I have them anyhow?

3. In my locality the honey-flow is scant for 60 days after swarming time. Should I feed my new syarms till conditions improve?

4. How can I stop robbing?

ANSWERS.—1. Generally not. With plenty of stores in the hive, so long as at least a little is coming from outside, brood-rearing will continue, and no amount of feeding you do will make any difference. If, however, an absolute dearth continues so long that the queen stops laying entirely, then feeding is of the utmost importance. In most places, however, that sort of thing never happens, and you can put it down as a pretty good rule that stimulative feeding and spreading brood are things best let alone.

2. If an empty comb or comb containing honey is entirely free from the bee-moth and its eggs or larvæ, then if you put it in a moth-tight place, it is safe. Indeed, such a comb is almost safe in any room in an ordinary dwelling without being moth-tight. Unfortunately, in nearly every case when a comb of honey or a section is taken from a hive, it contains at least the eggs of the bee-moth, and under favorable conditions those eggs will hatch. You will see that a comb containing eggs will not be helped by putting in a moth-tight place. Your recourse in such a case is to brimstone the larvæ or to use carbon disulfide, which last will destroy both larvæ and eggs.

3. The old rule was always to feed the swarm for a few days. I do not suppose it is really necessary, but at least it can do no harm, and if the bees cannot at the time get honey outside, it may do good.

4. Do not let it get started. In nearly every case of robbing the beekeeper is at fault, having done some fool thing to start the robbing, such as leaving bits of honey exposed. Various ways of stopping robbing have been used, one of the best being to pile hay or straw around the hive and keeping it thoroughly wet down with water. The robbers don't like to go through the wet stuff, and it does no harm to the bees of the colony.

Tin for Honey—Introducing Virgin

1. Is a tin tank good for extracted honey?

2. How long can I let honey stand in a tin tank without doing harm to the honey?

3. If I put all but one frame of brood in a hive-body above an excluder, leaving the other brood and the queen below, and fill the space in the lower body with frames of foundation and let them stand for seven days, and then set the upper body in a new place, could I safely introduce a virgin into this hive as soon as most of the old bees returned to their old stand? MINNESOTA.

ANSWERS.—1. Yes.

2. I don't know why it shouldn't stand all right for months if the surface of tin is perfect.

3. Yes; after the old bees have all returned to the old location almost any queen may be easily introduced. There might, however, be trouble with a virgin many days old. The easiest of all queens to introduce is a virgin less than a day old.

Swarms Leaving

About 6 o'clock one morning last week a swarm of my bees came out and went into a hive close by that was weak. About 3 o'clock the next afternoon I looked into the hive and found the bees had left. I didn't see them go and don't know where they went.

About 4 o'clock the next evening another swarm came out and alighted on the limb of a tree. I hived them. After staying in the hive a while they came out and went back into the hive from which they came first. The first was a small swarm, the second a very large one. What would you think caused them to cut such capers? ILLINOIS.

ANSWER.—Bees seem to take delight in doing unaccountable things, things that leave one guessing. Your first case is the more unusual of the two. It is not so very uncommon for a swarm to enter a hive already containing a colony, but why should the whole thing abscond? A virgin in the swarm helps a little as a guess, and possibly the hive was standing in a hot place, which, together with the excitement of the intrusion, made them swarm out.

The second case happens rather often, possibly because the queen has difficulty in going with the swarm, and possibly for some reason we don't know anything about.

Demaree Plan—Other Questions

1. I have 17 swarms so far. If I practice the Demaree or Allen plan of swarm prevention what will I do with so many bees after the honey season is over?

2. Should all queen-cells be cut out before the brood-frames are put into the upper story?

3. If after getting the swarm built up I should put comb-honey supers on, wouldn't the bees likely begin to swarm?

4. Do you believe in swarm prevention? I should think it better than having swarms emerge, as I should think that more honey will be produced than having the swarms leave.

5. A neighbor had a swarm emerge from his house. I hived it and the next morning it was out on a small tree about two feet high. I hived it again for him and a couple of days later I went over to his place and behold the swarm had left. After about 8 or 10 days a second one came out and I hived it. Next morning it was out, and so I hived it again. This time I put in a comb with young brood and it stayed. In about three days a third one came out and he gave it to me. I carried it home in a basket and put it into an old hive with four frames with full sheets of foun-

dation. The next day I went out to transfer them into a new hive, and they were not there. I can hardly account for that. The hive the neighbor gave me was a new 10-frame, complete with new frames and full sheets of foundation.

Do you think that was a swarm of a wild nature? IOWA.

ANSWERS.—1. Dont' worry about so many bees. You will have only the progeny of one queen in each hive, and the hive will easily hold them all.

2. Yes, and also 8 or 10 days later.

3. They might.

4. I believe in doing anything and everything to prevent swarming that will not lessen the crop of honey.

5. Those bees were probably no wilder than others, but having a virgin queen they were inclined to desert if everything wasn't entirely to their liking. Like enough they were too warm. It is always well to give extra ventilation to a newly hived swarm, especially if it has a virgin queen.

Catalpa

Is the catalpa bloom considered a honey-producer? KANSAS.

ANSWER.—I have never heard catalpa spoken of as an important honey-plant, and have never seen bees upon it, although I have had very little chance for observation.

Queen-Cells Not Destroyed

1. I have a hive of bees that I caught this year. They have most of their comb drawn. They had a queen, but she disappeared after laying a good many eggs. They now have several queen-cells started and several are hatched, but none have been destroyed. I always thought that the first queen to hatch destroyed all the rest.

2. The bees have most of the frames filled with honey or pollen, with some sealed brood. There are very few vacant cells where the queen can lay. Would this be likely to cause them to swarm? If so, what can I do to prevent it?

3. How much comb honey can I expect to get here in an average year? OHIO.

ANSWERS.—1. As a rule the first virgin that leaves her cell kills the others, unless prevented by the workers. If they decide it is best to send out a swarm they protect the cells from her.

2. It is not entirely clear just what the conditions were, but being crowded for room is an important factor in making bees swarm. You should allow abundant room in the supers *before* they have any crowded feeling.

3. That's a matter that varies greatly, depending on the season and the management. A beginner might feel well satisfied with 50 pounds to the colony.

Miscellaneous Questions

1. How much profit can be made out of one hive or colony of bees?
2. How many colonies can one man tend?
3. Which, in your estimation, is the best State for beekeeping?
4. What are assistants paid on apiaries, to learn?
5. Is there any future to the bee business, or is it overcrowded?
6. Will the price of honey drop down to 10 cents a pound, or how much will it drop?
7. What are the best books on the subject of beekeeping? IOWA.

ANSWERS.—1. That's a pretty broad question. An expert might run it up into the hundreds by having a colony of such good stock that he could rear queens from it and sell them at a good price. But if you mean how much can be get for the honey received from one colony, it might in rare cases reach $50 or more. But taking one year with another, the average beekeeper will be doing very well if he averages $5 per colony, and a beginner sufficiently expert at making blunders might make that amount about $5 less in any but a very good

2. In most cases probably not more than a hundred.

3. I don't know. The difference is likely so little that in most cases it would not pay a man to change from one State to another.

4. That's as it happens. In some cases the assistant gets his tuition for his labor, and from that it varies until he gets a fair wage for his time without reckoning his tuition.

5. So long as honey remains the best sweet known there is a future for the bee-business, and so long as tons of nectar are going to waste it can hardly be overcrowded.

6. It is hard to foretell the future. I wouldn't attempt to be a prophet, but my guess would be that while honey, like everything else, will come down in price, it will never again fall to the low level of past years.

7. Those published by the publishers of this journal are good. Among the others may be named Root's ABC and XYZ, Dr. E. F. Phillips' Beekeeping, Frank C. Pellett's Productive Beekeeping, and after you have these committed to memory you may be interested in reading Dr. Miller's Fifty Years Among the Bees.

Caging Queens

Do you believe a queen is injured by being caged ten days during the clover flow? Please fully explain your reasons for your opinion. OHIO.

ANSWER.—No, I don't really believe it does a queen any harm to be caged ten days in a hive during the clover flow, unless the cage be so small that she is allowed no room for exercise. If you press me for my reasons for thinking so I might answer with Falstaff, "Give you a reason for compulsion! If reasons were as plentiful as blackberries, I would give no man a reason on compulsion, I." Or, I might say I have no particular reason for it, and turn upon you with the question, "What reason have you for thinking it does hurt her?" It might be thought that there is a sort of violence in a sudden cessation of heavy laying. But she can keep on laying if she wants to, even if she doesn't deposit the eggs in cells. And ought there not to be some gain to the queen from a ten days' rest? I have had queens thus caged by the hundred, and never knew any harm to come from it. That's negative testimony, to be sure, and I'm ready to change my mind as soon as given a good reason to do so.

Bees Disappearing

I bought two colonies of bees one year, and the next spring I had four colonies; this was last year. Last fall I had four new colonies and seven supers of honey. I wintered the eight colonies in the attic of a dwelling-house and they appeared to be in good shape until lately, when three colonies disappeared. Nothing but the empty comb left in the hive, and another hive has just a few bees left. There seems to be fewer bees each day. One hive had the cover filled with honey and before I got around to put on a super the honey next to the brood-racks had young bees in it, but the rest was nice and clear. The only change I made from last summer is, I put concrete blocks under the hives. Each colony swarmed once last year, and I then kept the queen-cells cut out.

What is the reason my bees are disappearing? MINNESOTA.

ANSWER.—You say you let each colony swarm once last year, *and then kept the queen-cells cut out.* When a swarm issued from any colony there were left in the hive a number of queen-cells from one of which a future queen was to emerge. These cells you cut out. Then the bees started other cells from young brood in the hive. But these cells you kept cut out, and there being no more young brood in the hive the bees were left hopelessly queenless. So the disappearance of the bees was from death through old age, there being no young bees in the hive to take the place of those dying off. Next time, instead of keeping all queen-cells cut out, leave one from which a queen may be reared.

Transferring

I have 10 colonies of bees in standard 10-frame hives, which I desire to transfer to Jumbo hives. How can this be done? When is the best season to do this? ALABAMA.

ANSWER.—The transferring should be a comparatively easy thing, seeing that your old frames are the same length as the Jumbo frames. Follow the plan laid down in your book for transferring, cutting out the comb from the old frame and putting it in the lower part of the new frame. That will leave a vacancy of two inches or so at the upper part, and three or four of these vacancies can be filled by cutting up one of the combs into strips of the proper size. The best time to do this is when honey is coming in freely in the season, say in fruit-bloom.

Exhibit by British Columbia Department of Agriculture at Flower Show held at Nelson, B. C., during the Western Canada Irrigation Association's Convention, in 1918. Produced and staged by W. J. Sheppard, Inspector of Apiaries for the Kootenays.

NEWS

Another Association Formed.

A new beekeepers' organization has been formed at Torrington, Wyoming. A. B. Robertson is President, Mr. Pottello Vice President and Harry Eaton Secretary.

New York County Meeting

The Monroe County Beekeepers' Society of New York State will meet August 9 at 10 a. m. at the home apiary of its President, Louis F. Wahl, Scottsville Road, Lincoln Park, N. Y. Everybody welcome, and a general good time for the ladies is arranged. F. M. PILLSBURY, Secretary.

East Tennessee Beekeepers

The East Tennessee Beekeepers' Association was organized Thursday, June 28, at the Chamber of Commerce, Knoxville, when 250 representative men and women of the State gathered at the call of State Entomologist G. M. Bentley. Mr. Bentley was chosen President and Mrs. J. B. Young, Knoxville, Secretary and Treasurer. The President was empowered to name a Vice President in each of the 34 East Tennessee counties to co-operate in organization, legislation and fair exhibits. Nearly every member present at the organization meeting joined the association. Among those on the program were: G. M. Bentley, Mrs. J. B. Young, Knoxville; W. B. Green, Martel; Curd Walker, Jellicoe; Richard Crane, U. S. Department of Agriculture; O. M. Watson, Knoxville, and Kennith Hawkins, Watertown, Wis.

Beekeepers Meet at Ambler

The combined meeting of the Philadelphia Beekeepers' Association and the Pennsylvania State Beekeepers' Association held at the School of Horticulture for Women, near Ambler, on Saturday afternoon, June 14, was a big success from both a social and beekeepers' viewpoint. About 50 ladies and gentlemen interested in bees were present.

Millen to Ontario

Prof. F. Eric Millen has resigned his position as State Apiarist of Iowa to accept the position of Provincial Apiarist of Ontario. Mr. Millen has already entered upon his work at Guelph. He was very successful in his Iowa position and general regret is expressed among Iowa beekeepers that he has decided to leave that State. At last report the Iowa position had not yet been filled.

Texas Experimentalist

A letter from Prof. Paddock, the State Entomologist of Texas, conveys the information that Mr. H. B. Parks, who was Extension Apiculturist at the Agricultural College, has accepted the position of experimentalist in bee culture with the Experiment Station. Mention has already been made of the fact that the Legislature recently made provision for experimental work in beekeeping on an extended scale. Mr. Parks should be a good man for this work, as he has had wide opportunities for observation and is a close observer.

Instruction for Disabled Soldiers

The Government is making liberal provision for our disabled soldiers. Any who are interested in beekeeping will be provided with instruction at government expense at any of the following agricultural colleges:

University of Minnesota, St. Paul.
College of Agriculture, Ames, Iowa.
Agricultural College, Storrs, Conn.
College of Agriculture, New Brunswick, N. J.
Agricultural College, East Lansing, Mich.
Agricultural College, College Station, Texas.
Agricultural College, Manhattan, Kans.

The soldier and his dependents will be provided for by the Government while he is taking training, thus relieving him of any anxiety on this point. Plans are also under way for some special intensive courses of practical beekeeping instruction for disabled soldiers in addition to the regular courses offered at the agricultural colleges. Those interested may learn more concerning these opportunities by addressing the Federal Board for Vocational Education at Washington, D. C.

Beekeepers' Chautauqua

The program of the Wisconsin Beekeepers' Chautauqua, mention of which has already appeared in our columns, is at hand. This is a novel summer camp for beekeepers, to be held on the shore of Lake Mendota, at the College of Agriculture, at Madison, from August 18 to 23. Doctor Phillips and Mr. Demuth, from the U. S. Department of Agriculture, are announced to be present, in addition to prominent Wisconsin men.

Beekeepers' Picnic in North Idaho

Mr. and Mrs. Arthur Sires, who operate a number of bee-yards in Bonner County, Idaho, under the firm name of Sires & Sires, very cordially invited all the beekeepers in that region to attend a picnic and field meet on June 26, at their home apiary, about 10 miles from Sandpoint, and on the high bluff shore of Lake Pend d'Oreille.

About 40 beekeepers, including friends and neighbors, attended the picnic. Mr. Virgil Sires and a beekeeper nephew from Yakima, Wash., were also present. The Sires brothers have been specialist beekeepers in the Yakima country for about a quarter of a century, and produced honey by the carload. Sires & Sires now have several hundred colonies in their six or seven apiaries surrounding Sandpoint.

Mr. E. L. Ludwick, Bonner County Agricultural Agent, after the bounteous dinner, introduced Prof. H. A. Scullen, the government specialist in beekeeping, who gave a very interesting and instructive address.

GEO. W. YORK.

CLASSIFIED DEPARTMENT.

Advertisements in this department will be inserted at 15 cents per line, with no discounts of any kind. Notices here cannot be less than two lines. If wanted in this department, you must say so when ordering.

BEES AND QUEENS

ITALIAN QUEENS AND NUCLEI—
Untested queens, $1; tested, $1.50; select tested, $2.50.
1-Frame Nucleus, $2.25; 2-frame, $4.00.
1-lb. package of bees, extra, $2.25; 2-lb. package, $4.00.
A trial order will convince you of their merits. H. A. McCarley, Mathis, Tex.

THE AMERICAN BEE JOURNAL is prepared to furnish printing for beekeepers. High quality, prompt service and satisfaction. Our shop is in charge of a man who specializes in printing for the honey producer. Send for our catalog of honey labels, stationery, etc.
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FOR SALE—Fine Italian queens, untested, $1 for one; $5.50 for six; tested, $2 for one; $9 for six; tested by return mail, untested ready June 1 to June 10.
R. B. Grout, Jamaica, Vt.

FOR SALE—Leather colored Italian queens, tested, June 1, $1.50; untested, $1.25; $13 a dozen. A. W. Yates,
15 Chapman St., Hartford, Conn.

ITALIAN QUEENS—Northern-bred, three-banded, highest grade, select, untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness and perfect markings. Price, one, $1; twelve, $11; fifty, $45. Send for circular.
J H. Haughey, Berrien Springs, Mich.

FOR SALE—Hardy Italian queens, 1, $1; 10, $8. W. G. Lauver, Middletown, Pa., R. 3.

FOR SALE—Goldens, untested, 1, $1.25; 6, $6.50; 12, $11.50. S. A. Tyler, Emden, Ill.

THREE-BANDED ITALIANS ONLY—Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. H. G. Dunn,
The Willows, San Jose, Calif.

GOLDENS that are true to name. Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. Garden City Apiaries,
San Jose, Calif.

FOR SALE—Bright Italian queens, $1 each; $10 per doz. Ready April 1. Safe arrival guaranteed.
T. J. Talley, R. 4, Greenville, Ala.

FOR SALE—3-band Italian queens ready June 1. Untested, each $1; twelve, $10; 100, $80. No disease here and satisfaction guaranteed. A. E. Crandall & Son,
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LEATHER and all dark colored Italian queens, when we have them, mated, $1 each. These queens will include all that are not up to the standard in our goldens, but will be good utility stock. C. W Phelps & Son,
No. 3 Wilcox St. Binghamton, N. Y.

FOR SALE—3-band Italian queens from best honey-gathering strains obtainable. Untested queens, $1.25 each; 6, $6.50; 12, $11. Satisfaction guaranteed. W. T. Perdue,
Route No. 1, Fort Deposit, Ala.

OUR BRIGHT ITALIAN QUEENS will be ready for shipment after April 15. Untested, 75c each; half doz., $4.50, or $8 per doz. Select untested, 90c each; half doz., $5.50, or $10 per doz. Tested, $1.50 each. Safe arrival guaranteed.
Tillery Bros., R. 5, Box 1D, Georgiana, Ala.

FOR SALE—Pure 3-banded Italian queens, as good as you can buy with money, from June 1 to September 1.
J. F. Diemer, Liberty, Mo.

BEES AND QUEENS from my New Jersey apiary. J. H. M. Cook,
1Atf 84 Cortland St., New York City.

SWARTS GOLDEN QUEENS produce golden bees of the highest quality; satisfaction guaranteed. Mated, $1, 6 for $5; tested, $2.
D L Swarts, Lancaster, O., Rt. 2.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you desire. They are great honey gatherers, beautiful and gentle. Virgin, $1; mated, $2. C. W. Phelps & Son,
3 Wilcox St., Binghamton, N. Y.

FOR SALE—Three-banded Italian queens; untested queen $1, six, $5.50; twelve, $10. Tested queens $2 each.
Robert B. Spicer, Wharton, N. J.

EDSON APIARIES increased queen rearing facilities will insure the prompt delivery of A1 laying Italian queens, leather colored or golden. Prices reasonable Address
Edson Apiaries, West Butte, Cal.

FOR SALE—Italian queens; select just hatched, 50c; untested, $1. Especially safe introduction plan free. Order in advance.
James McKee, Riverside, Calif.

I. F. MILLER'S STRAIN Italian Queen Bees for sale. Northern bred, for business, from my best superior breeders; gentle, roll honey in, hardy, winter well, not inclined to swarm; leather color or 3-banded. Queens a specialty; 25 years' breeding experience. Safe arrival and satisfaction guaranteed. Untested, $1; 6, $5.50; 12, $10. Select untested, $1.25; 6, $6.75; 12, $13.
I. F. Miller, Brookville, Pa., R. R. No. 2.

FOR SALE—Golden queens second to none, for honey gathering and gentleness are unsurpassed; untested $2, tested $5 to $10.
E. V. Marston, Roxbury, Va.

FOR SALE—Queens, 3-banded Italians; selected untested, $2; selected tested, $3; safe arrival and satisfaction guaranteed.
Clinto Bradway, Monson, Mass.

FOR SALE—J. B Brockwell's golden queens, untested $12 per doz., $7 for 6, $1.50 each; 3-frame nuclei $8, with queen. Tested queens $3 each. J. B. Brockwell, Barnetts, Va.

FOR SALE—Golden Italian queens $1, 6 for $5; hybrids, 3 for $1.
J. F. Michael, Winchester, Ind.

ITALIAN QUEENS of "Windmere" for sale; untested $1, tested $2
Prof. W. A. Matheny,
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QUEENS, QUEENS—We are now up with orders; are mailing queens day after receipt of rush orders. No disease; satisfaction guaranteed. Best Italian untested queens 1 for $1, 12 for $11.50, 50 or more 90c each. I will care for your interests.
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FOR SALE—12 colonies bees in new 10-frame hives, wired combs, with 1 extracting super each, $7 each; 8 colonies bees in 8-frame hives, wired with 4 comb supers each, price $7 each.
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I AM PREPARED for shipping prize-winning queens. My queen was awarded first prize at State Beekeepers' Convention held in Little Rock May 31. Untested, $1; tested, $2.
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WARRANTED QUEENS—Dr. Miller's strain, $1 each, $10 per doz.; tested $1.50 each, $15 per doz. Safe arrival and satisfaction guaranteed. Geo. A. Hummer & Sons.,
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ITALIAN BEES for sale in 10-frame factory-made dovetailed hives, at $9 per colony. Pound packages of bees at $2.25 per pound, 2 pounds $3.75; untested queens $1.25 each. Add price of queen to bees in pound packages. No disease; inspector's label; satisfaction guaranteed.
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J. J. H., Box 5, Brownville, Fla.

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I CAN FILL ORDERS by return mail for my choice stock of 3-band Italian queens. See prices elsewhere in Journal.
A. B. Marchant, Doctortown, Ga.

FOR SALE—One hundred stands of bees in 8 and 10-frame hives, wired frames; bees healthy. Write for prices and particulars.
Duane Shaw, Palestine, Ill.

REQUEEN NOW with Simmons' queens; prize-winning strains of goldens and 3-bands. Till September 1; none later. Order now; one, $1.50; 6, $7.50. Fairmount Apiary,
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FOR SALE—Baby swarms, three frames and queen, $5. J. A. Dougherty,
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FOR SALE—Italian bees and queens (the kind that fill from 2 to 6 supers). Bees, $12 a colony; queens, $2 each, 6 for $11. Queens go by mail, bees by express. Order direct from this ad. Miss Lulu Goodwin,
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H. N. Boley, Hillsboro, Ia.

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FOR SALE—Finest Michigan raspberry, basswood and clover comb and extracted honey. Unexcelled for quality and flavor. Write for prices. W. A. Latshaw Co.,
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WANTED—Clover honey, comb and extracted. Buckwheat considered if price is right. State lowest cash price at your station. Sample will be requested if price suits.
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FOR SALE—New crop clover extracted honey, two 60-pound cans to case, 25c per pound.
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FOR SALE

FOR SALE—Clover and buckwheat honey in any style container (glass or tin). Let us quote you. The Deroy Taylor Co.,
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FOR SALE—Cedar or pine dove-tailed hives; also full line of supplies, including Dadant's foundation. Write for catalog.
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FOR SALE—Silver Spangled Hamburg eggs and fine, rare old Paganini violin for sale.
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FOR SALE—Photos of L. L. Langstroth, inventor of movable-frame hives, size 7x9; price, $1. American Bee Journal,
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FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
Superior Honey Co., Ogden, Utah.

FOR SALE—84 or 80 acres, 25 stands of bees, buildings, clearing, excellent location for beeman, near nice lake; will sell cheap.
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FOR SALE—8 acres land, 300 colonies bees; land in high state of cultivation, growing second crop now; price per acre, $200. Apiary in three yards; production highest average in 10 years, 96 lbs. extracted honey, lowest 23 lbs, per colony, S. Mason, Hatch, N. M.

FOR SALE—1 large hand-power Cowan honey extractor, 1 boiler wax press, uncapping can and honey press combined, 1 Barnes combined circular and scroll saw, hand and foot power. All in first-class condition.
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FOR SALE—Nearly new 25-20 cal. repeating rifle, Marlin model 94; will trade for extractor. Carl Franke, Mauston, Wis.

FOR SALE—Cowan rapid reversible extractor, practically new, $23. L. Clark, Winona, Minn

FOR SALE—100 colonies of Italian bees; several strains, with full equipment for extracted and comb honey. No disease. Seven State certificates. Will sell everything at catalog prices of equipment, bees and honey thrown in. A bargain for somebody with the cash. Moving away, reason for selling.
E. A. Leffingwell, Allen, Mich.

I CAN FILL ORDERS by return mail for my choice stock of 3-band Italian queens. See prices elsewhere in Journal.
A. B. Marchant, Doctortown, Ga.

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Crop and Market Report

Compiled by M. G. Dadant

THE CROP COMPARED TO LAST YEAR

In Massachusetts and the New England States, the crop is equal to last year, if not better. In New York it is probably 75 per cent of what it was last season, and reports, in some cases, state it will be about up to 1918.

In the States comprising Pennsylvania, Ohio, Indiana, and Illinois, the crop has been below normal, owing to the drought, although some localities have been favored with rain and will have a better crop than last year.

In the whole Southeast, the crop has been fairly good. Alabama claims about two-thirds of a crop, while Georgia and Florida will probably be normal. South Carolina is above normal.

Louisiana will have only a fair crop, but Texas has exceedingly flattering reports. In Texas the reports indicate that the crop will be from 200 to 300 per cent above last year, and reliable reporters state that it is above the normal crop covering a period of 10 or 15 years. Kentucky claims a little better crop than last year, while Missouri will be at least as good as 1918, as there was no crop in Missouri last year. Kansas is hardly up to 1918.

In Iowa the reports are very much varied in different localities. Eastern Iowa, as a general rule, will have very little crop, but western Iowa will probably range above last season. Reports indicate it will be 25 per cent better.

Michigan will have from one-third to three-fourths of last year's crop, which will be a little less than normal. Wisconsin claims a half crop, after a failure last year.

Minnesota is about half of normal and nearly up to last year.

Unfortunately, the crop in the inter-mountain States seems to be short. Arizona reports would indicate about a fourth of a crop, and New Mexico reports it will have less than in 1918. The majority of reports from Colorado indicate about half a crop. Wyoming is good, but not as good as 1918, and Montana is below last year. So is Idaho.

The same is true of the Pacific Coast States. California reports, as a general rule, from nothing to 75 per cent of last year, with a majority of the reporters claiming about 50 per cent of the 1918 crop. One lone reporter states he will get twice as much as last season.

Summing the matter up, the crop would fall short of last year, although the increased number of bees may increase the total somewhat. We await, with impatience, the data gathered by the Department of Agriculture as to just what percentage of crop there is this year. This, of course, is very slow in coming out, and may be three weeks to a month late.

CROP PROSPECTS

In the New England States the prospects for the balance of the year are above normal, while in New York they are probably normal. Ohio seems to have fair prospects, as do the other Central States, although there is not much fall crop harvested here. The Southeast will have very little during the fall, although there are minor flows. In Texas the prospects for a fall crop are good. There is an exception, however, in mesquite, which will be less than the average this year.

Apiaries located along the rivers, the Mississippi and Missouri especially, claim to have very good prospects for a fall flow. In western Iowa the same is true. The prospects from now on seem to be fine.

In the intermountain States the crop is not nearly all harvested, but the prospects appear to be about 50 per cent.

In California the prospects are mostly poor, although a few localities claim there will be a fair crop. All in all, we do not believe the honey gathered from now on will have any great influence on the market. The harvest during the last two months of summer is not very large when bulked in proportion to that of June and July.

PRICES OFFERED

Very few reported having offers on honey. One large Alabama producer was offered 13½ cents for tupelo and 15 cents for sweet clover honey, which offers he refused. Many Texas beekeepers have been offered from 11 to 15 cents for their extracted honey in two 60-pound cans. These, however, in practically every instance, were refused.

One party in Iowa was offered 15 cents, another in Idaho sold his comb honey for $6 per case, and several reporters in California had been offered and refused 17 cents for orange and 16 cents for white sweet clover. The situation as to offers has not changed very much from our last report. The big buyers seem to be holding off to see just where the market will settle, thinking possibly prices will drop later on.

PRICES EXPECTED

It is very pleasing to note that beekeepers are a unit in thinking they should get a good price for their honey. Only one or two beekeepers state they will be satisfied with the price of 13 to 15 cents for extracted and $5 per case for comb. Practically all the others desire in the neighborhood of 16 cents for amber and 18 to 20 cents for white extracted honey, with a price ranging from $6 to $7 for comb.

The California Co-operative Association raised their prices over previous quotations and are now asking 18½ cents for orange and 16½ cents for white sweet clover honey, f. o. b. coast. The Texas Association is expecting to get for its members in the neighborhood of 16½ to 17 cents for light amber extracted, and proportionately more for bulk comb.

It is interesting to note that reporters, as a rule, ask more per pound for their honey than is being quoted on the market by the different Co-operative Associations. This shows a tendency favorable to holding this honey off the market until the association price is accepted as the standard.

The Texas Association has sent out a bulletin to its members urging them not to sell at a reduced figure. Evidently there are plenty of buyers at a low figure, if the beekeepers are willing to accept. The Texas Association has made arrangements, also, for storage of their honey. Beekeepers may get 60 per cent of the value of their honey as soon as it is placed in a bonded warehouse. In this manner the association executive can hold the honey until they get the proper prices. A similar plan, no doubt, is being carried out by the California and Colorado Associations.

Threre is not much doubt that the formation of the many county associations throughout the whole United States has had a gratifying influence in holding up prices. The beekeepers have found the benefits of association and will apply them to marketing as well as to purchasing supplies and handling their colonies.

WHAT WILL PRICES BE?

It is a very difficult matter to make any guess as to where prices will settle. There are some important items which will have a bearing. The beekeepers seem to be working as a unit towards prices almost as good as last year's, and this they should have in order to compensate them for the high prices of all supplies, tin containers, etc.

Another thing which will help hold up the price is that the well-posted authorities state there is a shortage in the sugar supply for the season of from one to two million pounds.

The export of honey also is going better now, and more and more is being shipped out.

Notwithstanding all this, the demand for honey is not excessive. It is, of course, a little early, and we look for requests for prices to come in at a good rate as soon as cooler weather arrives.

We have received one report of request for prices on two carloads of white honey for December delivery. This came from a former wholesale liquor firm, who had evidently changed to the manufacture of sweets of some kind. It has further been reported that a large Missouri brewery is turning its entire equipment toward the making of candy. No doubt the output of soft drinks, sweets, etc., will be very much enlarged through the enforcement of the anti-liquor law. How much effect this will have upon honey is yet to be seen.

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Untested	$2.00	$ 8.50	$15.00	$1.50	$ 7.50	$13.50	$1.25	$ 6.50	$11.50
Select Untested	2.25	9.50	18.00	1.75	9.00	16.00	1.50	7.50	13.50
Tested	3.00	16.50	30.00	2.50	13.00	23.00	2.00	10.50	18.50
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AMERICAN BEE JOURNAL

VOL. LIX—NO. 9 HAMILTON, ILL., SEPTEMBER, 1919 MONTHLY, $1.00 A YEAR

HONEY PRODUCTION IN THE SAGE DISTRICT

Notes on the Methods of a Well-Known Beekeeper Who Produces Honey on a Large Scale---By Frank C. Pellett

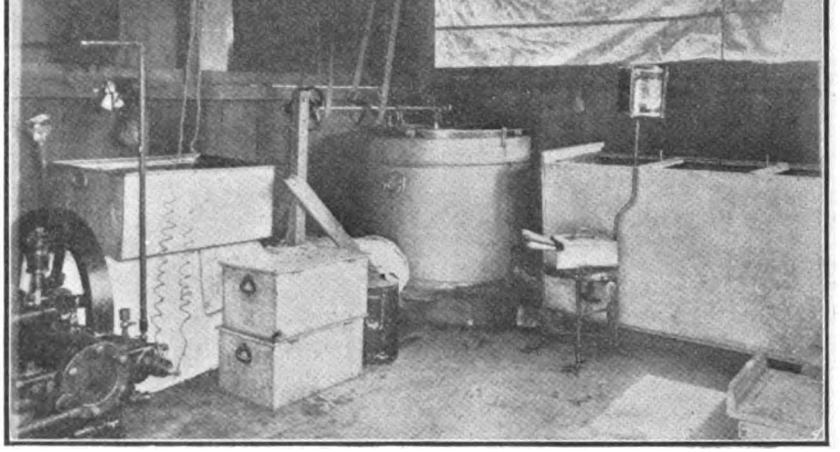
M. H. MENDLESON, of Ventura, Calif., is well known to the readers of the American Bee Journal. Beekeeping has been his life work and he is eminently successful. During the California short courses Mendleson was a center of attraction everywhere. Government experts and editors of journals received due attention, but it was easy to see that Mendleson, the man who had made such a conspicuous success of honey production under California conditions, was the man whose acquaintance California beekeepers were most anxious to make.

Mr. Mendleson has been a beekeeper since 1871 and has been in the business continuously in California since 1881. Few men have equalled the large crops which he has produced and none are more careful about the details of daily attention to the apiary or the preparation of the crop for market.

In our April issue, in connection with the story of California's first extensive beekeeper, J. S. Harbison, mention was made of the incident that started Mendleson to California. It was in 1876 that Harbison shipped ten carloads of honey to the New York market. Hearing of the shipment, Mendleson went to the city and saw the honey. He became so much interested in the possibilities of the west that he later left his home in New York and located in California, where he has since remained.

Mr. Mendleson tells interesting tales of the early days in California. On his first arrival from New York he entered the employ of Mr. Wilkin, at Sespe, where he spent two years. Wilkin was at that time one of the large producers of California honey. The trip to the west was an eventful one for young Mendleson. Reaching Santa Barbara by boat, he took stage for Santa Paula. Here he left his trunk at the stage office and started on foot to Sespe, 9 miles distant. About four miles of the distance had been covered when darkness overtook him, and he found the road had been plowed up. It is easy to imagine the feelings of the young man just from the East at finding himself lost in a strange, unsettled country. After wandering about for a time, he saw a light and in due time came to a shack occupied by a long-haired man with one arm who was living alone with his bees in a remote situation. In spite of the appearance of his host, Mendleson declares he was never better entertained in his life. The lone beekeeper was a well educated man, who shared his rough quarters with the wanderer. Next morning Mendleson continued his journey on foot. When he finally reached the Wilkin quarters he found a two-room shack. The family had come up to the apiary site to spend the summer months, leaving their home in Ventura. He found Wilkin also with long hair and beard and his wild appearance, 'ogether with the strange surroundings made the young man very homesick for a time. However, he found his employer to be genial and refined, and he was soon busy and content.

Getting supplies in and the honey crop out was a much more serious matter in those days than is the case now, with the fine roads and automobiles. Then there were no roads except mere trails, and of course horses furnished the only means of trans-



Interior of Mendleson's honey-house at Piru

portation. In 1881 they brought in the tin plate and made cans, in which to store the honey crop, right in the apiary where they were to be used.

Mendleson is located in the sage district of Southern California and for thirty years has been moving to the bean fields. Ventura County is said to have produced last season 72 per cent of the lima beans of the entire United States. Lima beans and the black-eyed beans are the two varieties which produce nectar in abundance. The black-eyed beans yield a dark amber honey, but of good quality. The honey from lima beans is almost water white and of fine flavor. Mendleson has secured as high as 150 pounds average per colony of this fine honey in a good season. A peculiarity of the bean honey is that it will sometimes sweat and ferment on the hives of weak or medium colonies near the coast. With strong colonies this seldom happens, even near the coast, and not in any case in the interior, where it is improved from being left on the hives. The bean honey granulates easily.

While Mendleson practices migratory beekeeping, he moves to the same location year after year and has a complete outfit at every apiary site. His Piru apiary is perhaps as widely known as any single apiary in America. Many photographs have been published showing this most attractive outyard. The model arrangement, with the background of mountains, makes a most attractive picture. Another illustration herewith shows the interior of the honey-house at this yard. It will be seen that he has a complete power outfit with every labor-saving device.

He formerly made a practice of requeening all his colonies every two years. Since he has had to contend with European foulbrood he requeens every colony that does not build up quickly in spring, and never allows any queens more than two years old. With his 1,400 to 2,000 colonies the queen-rearing operations alone make quite a business. For this work he has a lady engaged who makes it a specialty. Women are well adapted to queen-rearing, as they are careful and painstaking, and there

A crew of women workers at the Mendleson yards

is no heavy lifting connected with this particular work.

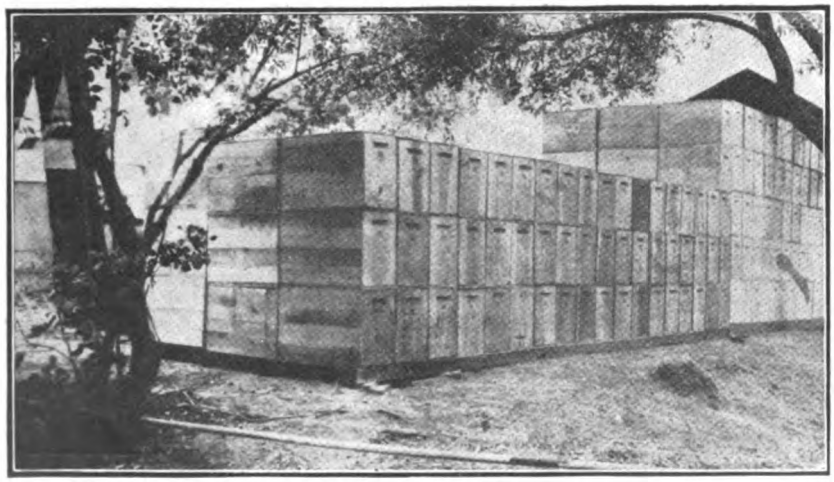
In the Mendleson apiaries women take a prominent place in the regular work. Our illustration shows a group of four of them in special farmerette suits. Except for the heavy lifting at extracting time and when moving the bees he finds the women make very satisfactory beekeepers. In addition to his crew of women beekeepers he hires one man by the year and gives a hand himself wherever help is needed.

It is his practice to leave about twice as much honey on the hives as will be needed in a favorable season. He insists that surplus left with the bees pays big interest, as it saves feeding in times of shortage and insures that brood-rearing will be continued at proper times, even though no honey is coming in. An abundance of stores and plenty of room in advance of the honey flow is the best insurance of a crop. More California beekeepers fail from extracting too closely than for any other reason. His largest crop was more than 100 tons and had he been able to get sufficient skilled help and enough cans to hold it he feels that this particular crop might have been nearly double. When a big flow is on it takes a lot of action to keep up with it with a couple of thousand colonies of bees.

In a good sage year it is possible to keep a lot of bees together without overstocking. The sage crops always come following wet winters. One year he kept 800 colonies in one yard. However, the sage often fails for two or three years in succession. When a flow does come the bees pile up the honey in a way to gladden the heart. He has had from one to five full-depth Langstroth supers filled on every hive in three days' time during such a flow, with an average of two such supers for the yard. There have been only two of these exceptionally heavy flows in his thirty-eight years of California experience. After the three days of heavy flow he was able to extract twice again six days apart and once more after another nine days of time. All told, the average was more than 300 pounds per colony from sage.

His bees work lightly all winter on the eucalyptus or gums, if the weather is favorable. However, there is little dependence to be placed on the honey from this source, and it is important to leave the bees with honey enough to carry them through. He gets his crop from sage in spring and moves to the bean fields about July 1. Although sage may fail, he regards the bean crop as almost certain. East winds sometimes blast the bloom of the beans, but this is rare. They bloom through a long period, beginning in July and continuing until September. The bloom is prolonged with irrigation. His average from beans is about 50 pounds per colony per year.

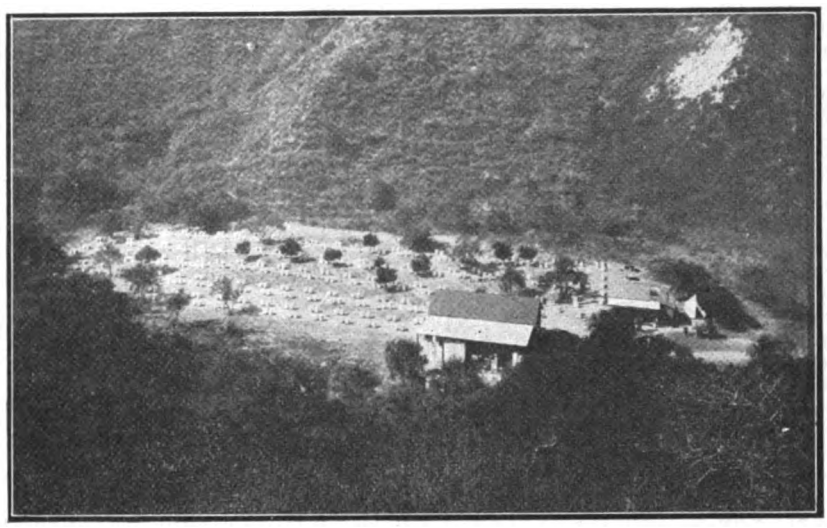
A special feature of the Mendleson equipment is the series of big tanks, four each holding seven tons, two eight tons and one ten tons, providing a combined storage capacity of fifty-four tons. In addition to these he has several four-ton tanks. After one disastrous experience, when he lost a considerable portion of his crop because he was unable to get cans, he decided never to let it happen again. The big tanks provide against any such calamity in future. With a crew of six men he has extracted and filled with honey a seven-ton tank every two days during the rush of a good season.



Thirty-ton crop in Mendleson apiary

One experience of a kind is always sufficient to insure that Mendleson will be prepared next time. When he had his first experience with American foulbrood he shortly cleaned it up and has always been on the watch for its reappearance. When European foulbrood came along, thirty colonies from all his apiaries was the highest loss in one season. Since then he has constantly practiced preventive measures, keeping his colonies strong and requeening frequently with resistant stock.

He puts up his honey in attractive packages and seeks the best trade, thus realizing better prices for his crop. He sells through only one dealer in one city, and supplies him year after year. On the whole, there are few beekeepers who might not learn some valuable lessons from M. H. Mendelson. When it comes to turning out the work, he can set a pace that makes a good man hustle to follow. On one occasion, as a test, he took off, alone, and extracted 1,500 pounds of honey in half a day.



One of the Mendleson apiaries in California

Beekeeping in Australia

(Concluded from August)

By T. Rayment

South Australia

In our previous article we dealt with "The West." Well, to proceed, we may travel east by the transcontinental line, one of the greatest railways in the world, which runs parallel with the southern coast, or, we may board one of the British mail steamers and disembark at Adelaide. To get back to the vernacular we are now in the Holy City" in "Southos." The latter is the Australians' affectionate name for the State of South Australia, and the former is the same worthy's cynical cognomen for the beautiful capital city renowned for its many churches. Before the Feration of the States, South Australia was comprised of a band running clear through from the Great Southern ocean to the tropical seas of the northern boundary. After federation, the commonwealth accepted the northern half, which is now known as "The Territory." Your readers will now perceive the necessity for two sub-divisions.

South Australia is old in its ways; sedate is the proper word. It is the lucky owner of a calm exterior. It has a big range, heavily timbered, frowning down over the city, and its beekeepeers are a calm, good-tempered lot of people. But don't imagine that their staid behavior precludes them from effecting concerted action when it comes to disposing of their big crops—**and they do get big crops.** Don't forget what we have already said about the State, for all the bee-farms are in the southern portion. In South Australia the big crops are gathered from the ubiquitous "Gum trees" or Eucalypts. There are "Red" gum, (*E. rostrata*), "White" gum (*E. paniculata*), South Australia "Blue" gum (*E. leucoxylon*), "Sugar" gum (*E. corynocalyx*), "Pink" gum (*E. fasciculosa*) two or more "Peppermints" (*E. odorata* and *E. amygdalina*), "White" box (*E. hemiphloia var albens*), and last but not least, the remarkable and glorious pink-flowered *Eucalyptus calophylla var rosea.* Now you must experience a flow from the species named to appreciate the immense quantity of nectar secreted. Of course there are many other shrubs and plants, not forgetting that golden harbinger of spring, the "Capeweed," already mentioned. All day long the bees roar in the trees; mere humming is quite inadequate to describe it. When one remembers that there are hundreds of flower buds in a single group about two inches in diameter and that the whole tree resembles giant cauliflower when in bloom, some faint idea is gleaned.

The trees in South Australia are more dwarfed in general, but for pollen and honey they are hard to beat. Just at present the State Beekeepers' Association is in abeyance for reasans that are outside the ambit of these articles. Along the Murray river there are fruit gardens in abundance, but the exportable crops are the product of the gum trees.

At one time the South Australian Government interested itself in the export of honey from that State and, through its Agent General in London, made a contract with a leading firm of London caterers to place South Australian honey on all its tables. "Good biz," too. It also advanced so much when honey was on board ship. (By the way, the same State experimented with "egg circles," that is to say, the Agricultural Department organized a collecting system to gather the "hen fruit" of the farmers' "chooks")

There are many up-to-date apiarists in South Australia, but there is room for thousands more, and some day, when Europe quiets down and feels "sweetish," there is going to be a big banking account for some "Aussies."

"The Territory." Now let us tell you something about the northern part of the State now controlled by the commonwealth, named "the Territory," best known to the Southern States as the "Never Never."

In spite of all written to the contrary, central and northern Australia is not desert-like in any one particular. We have not traveled across Australia ourselves—dashed few have—but we have many photographs, and more, the actual experience of an exmounted constable who has "cobwebbed" the immensity of the Territory at all seasons of the year. There are mountains and great rivers and pasturing places that "run" stock by the 30,000 or 40,000 head. And there are Eucalyptus trees in abundance, and the ex-mounted man saw two and three bees' nests in each tree. Honey, wax and pollen in abundance.

But there we stop. The "Illumbria," as the black aboriginals call the native "Gum" tree (*E. tesselaris*) is a splendid honey producer, but the bees' nests are not those of the hive bee (*Apis mellifera*), but of the tiny native bee *Trigonum.* My friend says: the grass grew as high as the saddle flaps, the streams teemed with fish, honey was everywhere, and carpenter bees and mason bees, and occasionally a black fellow crept after him to launch a spear from the cover afforded by the rank growth of trees. The blacks like honey and refer to a wild bee-colony as "white pfellars sugar bag." We Australians are only just tickling the outside edges of our country. When we wake up and "get a move on" the United States won't have a monopoly of "The States." People will say, "do you mean the States of Australia?"

On the grassy plains of the Territory there are large herds of buffalo and "good money" is earned by those hunters who travel the vast areas to shoot the animals for their hides; the rest of the beast is permitted to decay; transport difficulties preclude the utilization of the other portions. Port Darwin is the sea port of the north and some very large meat works operate there, for the Territory is primarily a "meat" country. Apiculturally, the Territory remains a *terra incognita.*

A telegraph line stretches across the continent, and the linesmen who live in small groups many hundreds of miles from civilization, are always

on the lookout to welcome, or succor any travelers who should happen to pass that way. In case any of you readers undertake the journey—it must be done on horses, with a spare animal or two to carry the packs—their movements would be telegraphed ahead and a royal welcome extended to any travelers from the "outside."

The "Great Australian Desert," as the legend on the maps goes, is not a desert in the sense understood by the man in the street. There are great areas of "prickly spinifex" that can only be penetrated by certain tracks, but there is a "wet" or rainy season, when the great rivers rise and become navigable for many hundreds of miles.

In the closely settled portions of the commonwealth the beekeeper has to contend with the settler and the grazier who, in their efforts to secure more grass, "ring" the gum trees. That is, they cut a complete ring around the trunk which effectually prevents the tree from drawing any further nourishment below the "ring bark," for it is through the outer layers of fibre, etc., that the sap flows upward. This does not apply to the conifers, or pine trees, which draw up their sustenance from the center and increase by the formation of successive cylinders of primary and secondary bast.

In the "out back" areas there is little or no ringbarking.

Some Observations on Nosema-Disease

By G. F. White, Bureau of Entomology, Washington, D. C.

(Concluded from August)

Queens have been taken from Nosema-infected colonies and introduced into healthy ones, with the result that the colonies remained free from infection. Queens have been reared and mated in Nosema-infested colonies, and have recovered from the infection and remained healthy. It has also been seen that colonies show a marked tendency to recover from infection. Examinations have shown, furthermore, that in diseased colonies it is the exception, and by no means the rule, to find Nosema-infected queens. Fear, therefore, that queens are a fruitful source of infection in Nosema-disease, would be by no means justifiable.

Numerous observations strongly indicate that the disease is not likely to be transmitted by means of drifting bees or drones.

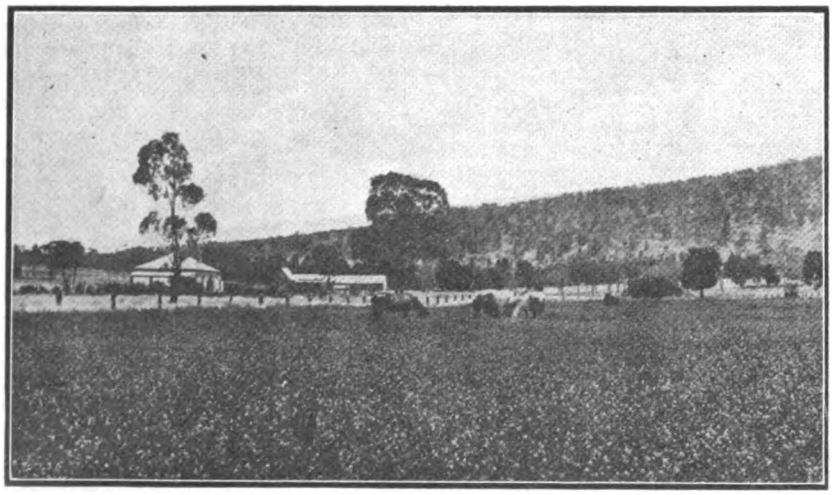
While it would seem that, under favorable circumstances, the disease might be transmitted by honey, the chances that this is done are much less, probably, than one would at first expect. Certainly, after 2, 3 or 4 months of spring, summer or fall temperature, the germs would be destroyed and no disease could result from such a source.

In most instances Nosema-infection does not spread rapidly from the infected bees of a colony to healthy ones of the same colony. This statement is supported by observations made on the disease, as it is encountered in nature, as well as in experimental colonies. During the studies made in 1912, on the apiary already referred to, Nosema-infection was found in all of the colonies, at one time or another, during the year, yet the percentage of infected bees in the apiary diminished from spring to fall. In experimental colonies, as has been said, the colony tends to recover from the infection. Were it true that the infection spreads rapidly from infected bees to the healthy ones of the same colony, the effect of the disease on the colony would be very different from what it is. Less is known concerning the transmission of the disease within a colony during the winter season. That the spread of the infection, within the colony, during this period, is not great in most instances, is evident.

Likely Source of Infection From Nosema

The watering place may be a likely source of infection. That bees void their excrements while on the wing and soon after leaving their hive, is certainly true for flights made during the warm days of winter and early spring. Beekeepers will know whether this is true for other seasons of the year. The excrement of Nosema-infected bees, falling into a body of water, contaminates it with germs and makes it a fruitful source of infection. This is true since the parasite remains alive for a considerable period in water. Should the body of water be a rapidly moving one, the chances for infection would be very much reduced. It will be readily seen also that the chances for infection would rapidly diminish as the distance of the water supply from the apiary increased.

"Wonga Wonga" vine. No, it is not a giant swarm of bees, but a vine indigenous to Australia. The photograph shows that it has almost covered a "rung" gumtree. The gum-trees are killed by a complete ring around the trunk, but a pine cannot be disposed of that way.



A typically Australian view. In the background, rising land timbered with native trees. In the foreground is a "flat" with a fine growth of lucerne. The buildings in the middle distance are the homestead, stables, etc. The picture was taken in New South Wales.

Robbing a Possible Source for Nosema-infection

Colonies which become weak, as a result of Nosema-disease, naturally are an easy prey to robbers. Definite observation to show that the robbing of hives, which have housed such colonies, results in infection, has not been made, however. Indeed, when frames from such colonies have been inserted into healthy colonies, the disease has not been transmitted to any appreciable extent. That robbing, in connection with Nosema-disease, is of less importance to the beekeeper than it is in connection with the brood diseases is evident. Until more has been determined, however, it is well for the practical beekeeper to consider robbing as one of the pos-

sible sources for the spread of the disorder.

Diagnosis of Nosema-disease

With very little experience beekeepers can diagnose Nosema-disease satisfactorily at the apiary. A weak colony, in the spring of the year, should be suspected. Since there are many conditions which cause colonies to become weak, a further examination is always necessary. This is done by catching and removing the stomachs of about 10 field bees of the colony, and noticing the appearance of these in a way which has already been described in this communication. Often fewer than 10 bees are sufficient, while sometimes it is desirable to examine a larger number. Fairly strong colonies may contain a considerable number of Nosema-infected bees. This occurs, however, less frequently than with weak colonies. Not uncommonly one may find a small percentage of diseased bees in colonies which otherwise appear entirely healthy.

The Chances of Recovery in Nosema-disease

As has been pointed out above, there is a strong tendency for a Nosema-infected colony to recover from the infection. Some colonies die, but fortunately the percentage is small. If more than one-half of the bees of a healthy colony, upon examination, are found to be Nosema-infected, the chances that the colony will recover from the disease are decidedly unfavorable; if practically all of them are diseased, the colony will surely die; if less than one-half of the bees are diseased, the progress is fair for recovery; if only a small percentage are diseased, death of the colony is not to be expected.

It seems probable, from the observations thus far made that the losses sustained from the death of colonies does not represent the major losses to the beekeeper in Nosema-disease. The weakness produced, in colonies that live, may be the larger factor, the colonies being weakened at a time when it is especially desired that they should be strong. In this respect the disease is more like sacbrood than the foulbroods.

Conclusions

If the beekeeper has gotten the view of Nosema-disease which the writer has attempted to convey by these discussions, he has gained the following impressions:

Nosema-disease is no new disease, but one which has been among bees for a very long time.

The disease may cause the death of colonies or may only weaken them.

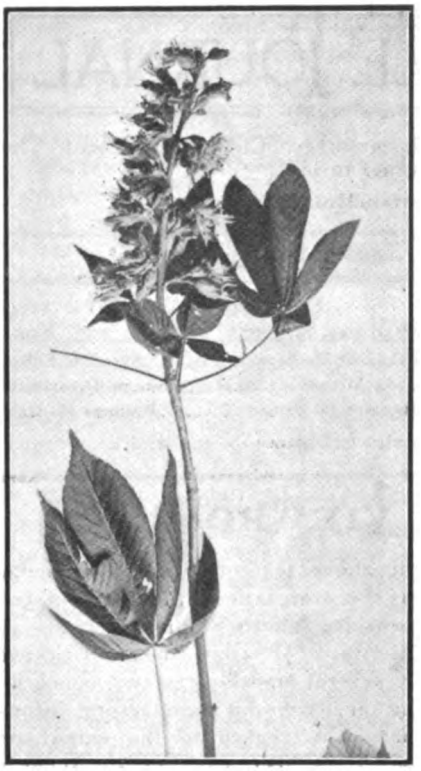
Like sacbrood, it is very widely distributed.

It does not produce the heavy losses, in infected apiaries, which are common for the foulbroods. In this respect, also, the disorder is like sacbrood.

The losses resulting from Nosema-disease are greater than those from sacbrood. It is, therefore, a disease of considerable economic importance.

It is caused by a parasite (**Nosema apis**) which attacks the stomach of the adult bee.

Workers, queens and drones are susceptible to infection, the brood is not.



Blossom of the Buckeye, or Horse Chestnut

Outside the living bee, the germ dies in a rather brief period, and is quite susceptible to heat and other disinfectants.

Neither drones, queens, simple contact with infected bees, drifting bees, hives, bee supplies in general, nor flowers, are to be feared as fruitful sources of infection in the disease.

Diseased colonies possess a strong tendency to recover from the infection, without attention from the apiarist.

There is much yet to be learned about Nosema-disease. The facts which have already been determined, however, are sufficient to make it possible for the practical beekeeper to devise methods, for the treatment of the disease, which will be both efficient and economical.

Those who are interested in reading further of the studies that have been made on the disorder may find Bulletin 780, of the United States Department of Agriculture, of some interest.

The Buckeye or Horse-Chestnut

THE buckeye or horse-chestnut, (**Aesculus**) is widely distributed and well known because of the poisonous properties of the peculiar nut-like fruit, everywhere called buckeye. There are several species, with minor differences. The photograph is of the blossoms of the Ohio buckeye (**Aesculus glabra.**) This species occurs from New England west to Iowa, Kansas and Oklahoma, and south to Georgia, Alabama, and east Texas. There is a species common on the Pacific Coast, known as the California buckeye (**Aesculus californica.**)) This species is reported as yielding considerable honey in some localities in California and some beekeepers think it is poisonous to the bees.

The buckeye is widely mentioned as a honey-plant, though there are few localities where it is sufficiently abundant to be important as a source of surplus.—F. C. P.

Habits and American Foulbrood Treatment

By Arthur C. Miller

I WONDER just what makes men slaves to apparatus, why they use certain implements when they can do better without them? In "shaking" for the treatment of American foulbrood how often we find the first shaking made onto a full set of frames all nicely fitted out with foundation starters. And, oh how often, it is hard to change the operator from such practice and get him to use a simple box or a hive without frames, letting the bees build onto the cover such bits of comb as they will.

For the second shaking, full sheets of foundation should be used, with frames carefully wired, the wires stretched so tight that they will hum when struck, and for best results in rapid resumption of comb construction and brood rearing the foundation should be painted with melted wax (the Vogeler process).

In addition it is exceedingly good practice to give food to the colony after the second shaking and for this purpose candy or soft sugar is preferable to syrup. Most any of the soft, moist, cream-colored sugars work well in a division-board feeder. "Raw" sugar is even better when it can be procured. Candy suitable for the purpose is simply granulated sugar and water boiled until it will make a hard candy. A cupful of good honey to each ten pounds of sugar and boiled in improves it. Such candy is poured into shallow cake pans, filling them to one quarter of an inch from edge. Leave the candy in the pans and invert one or more on top of frames and the bees will lick away at under surface until it is all consumed. Leaving the candy in the pans prevents the absorption of moisture except where bees can lick it off and the candy stays firm and solid until consumed.

The food is always an advantage after shaking the second time, for the bees' sacs are empty, and if adverse weather condition arise the colony is not only saved from disaster but has a reserve store of food which maintains the work at a steady pressure.

The painting process not only prevents stretched foundation but it enables one to use very thin foundation. Standard brood foundation runs about 7 L sheets to the pound, and at present prices costs 10c per sheet, or $1 for ten frames. Light brood running 12 L sheets to the pound costs 7½c per sheet, or 75c for ten.

Providence, R. I.

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language. Consolidated with The National Bee Journal in 1874.

Published monthly at Hamilton, Illinois.

Entered as second-class matter at the postoffice at Hamilton, Illinois.

SUBSCRIPTION RATES—In the United States and Mexico, $1 per year; three years, $2.50; five years, $4. Canadian postage 15 cents, and other foreign countries 25 cents extra, per year.

All subscriptions are stopped at expiration. Date of expiration is printed on wrapper label.

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THE EDITOR'S VIEWPOINT

Translations

Each nation considers itself the greatest on earth. **We** have won the war, even if the Italian, the English, the French and the Belgian,severally know positively that **they** have won it. It is thus in every pursuit. Each nation thinks itself just a little better than the rest, even in beekeeping.

But when we think of the past progress, we are compelled to acknowledge that, if we are the most practical beekeepers, we owe a great part of our success to the discoveries of other nations. Parthenogenesis was not discovered here, neither was the invention of the honey extractor, nor that of the comb-foundation. We must acknowledge that we need other countries and the information that they can impart. So translations of interesting subjects are imperative.

Some of our contemporaries publish clear translations of bee subjects and make use of them by comparing them with other contributions from different nations. In the present number we see L'Apicoltore bringing together statements from the American Bee Journal and from "Die Bienen" on the same subject. It makes interesting reading.

We are always proud to see quotations from our magazine in foreign publications, and this happens often. But some of our brother editors, in foreign countries, are not sufficiently strict in the selection of a translator. In our December, 1918, issue, there is an editorial which begins as follows: "We have been trying for several months to secure satisfactry information concerning the extent to which the bees work on the tobacco plant." A contemporary magazine translated the article and the above sentence was so distorted in the translation that, if we retranslate it into English, it reads as follows: "We have been criticized by several monthly reviews, concerning positive and satisfactory information in regard to the extent to which the bees work on the tobacco plant."

This is not the only instance in which incorrect translations have been made into foreign language from the American Bee Journal, and that is why we wish to call the attention of our foreign brother editors to the matter.

Off to Colorado

Our Associate Editor is spending some time with the beekeepers of Colorado. With note-book and camera he hopes to bring back some of the best of Colorado beekeeping for the pages of the Journal during the fall and winter months. Some of America's best beemen are to be found in the Rocky Mountain region and we believe they will have something worth while for him.

A Quarantine Law in Florida

The Florida Legislature has recently enacted a law placing the control of bee diseases under the State Plant Board in charge of Wilmon Newell. An appropriation of $10,000 has been provided to enforce its regulations. There is, as yet, but little foulbrood in the State of Florida, and an attempt will be made to prevent its being introduced from other States. Stringent regulations against the import of bees or equipment without a certificate of inspection have been adopted. Since the Plant Board has a large number of inspectors in all parts of Florida, it will be difficult for bees to enter that State by freight, mail or express without passing under the eye of one of these inspectors. Beekeepers who intend to ship bees to Florida should communicate with Mr. Newell at Gainsville to make sure they are able to comply with the regulations. Otherwise they may find themselves in serious difficulty. Few States have taken up the matter of disease control until it has become so widely spread as to be impossible of eradication. Since Florida is still comparatively free from it, we hope they will be successful in keeping it out. Mr. Newell is a thoroughly competent man and can be expected to act with the utmost good judgment.

Daily Field Trips of a Worker

The oldest Italian bee magazine, L'Apicoltore, gives every month quotations from bee literature. In its June number, we find a translation of our editorial on page 121, April, in which we quoted Mr. Demuth on the number of trips which a worker bee makes to the field in a day. The reader will remember that the average found by him was only 4 trips. We were astounded at so small a number and the Italian editor, in quoting us, remarks:

"The Signor Dadant had cause to be astonished and we are glad to report on this question the experience of a beekeeper, mentioned in July, 1914, by 'Die Bienen und ihre Zucht.'

"A beekeeper of Holstein made notes on this matter that are worthy of respect. He colored six workers with different colors and sat by the hive that contained them from 6 in the morning until 7 p. m., with a note book, a watch and a pencil. Each marked bee, as it went in or out, was made note of, in such fashion that by evening the tablet looked like a railroad time-table. He remained there the whole 13 hours, even taking his meals near the hive. The observations were continued the following day. The number and the duration of the trips corresponded with those of the first day.

As result of this experiment, the persevering observer stated that he now knows that bees make neither 40 trips, as reported by Zander, nor 25, according to Klaus, but only about 10. In addition, he ascertained that their flight lasted from a half hour to 2 hours, an average of an hour, and that the bees at each trip remained but a short time in the hive, between 5 and 10 minutes."

The Italian editor adds: "The evident result of variety of observations is that the number and duration of the flights are, and must be, varied, according to the extension of the bloom, the abundance of nectar secretion, which is exceedingly variable, and the distance to be traveled. An accurate study of this question may be of value to calculate the divers conveniences in the location of an apiary."

Winter Stores

It may seem a little early to talk of winter stores, in September. Yet this is the month when, in most of our Middle States, the bees store the surplus needed in the brood-chamber for the use of the bees, not only for winter, but for brood-rearing in spring.

The older we are, the better we realize that the bees are too often restricted, for stores, to an insufficient amount. In the production of extracted honey, especially when the supers are of easy access to the bees, they often fail to store a sufficient amount in the lower story to carry them through. Not so in comb-honey production. In the latter case, they always, or nearly always, crowd the brood-combs with honey, so that the queen may even be narrowed down to a few combs only for breeding. Both of these conditions are bad. If the breeding room is deficient, the amount of brood reared at the proper time to furnish a good cluster of young bees for winter will be inadequate. A small winter cluster in a hive full of honey is as bad as a larger cluster with insufficient food.

This is the month when we must investigate the conditions of the brood-nest. If too little honey is placed there, we find it quite beneficial to crowd the bees into a smaller number of supers, so that enough of the crop may be placed in the brood-nest, above the cluster, where it will be handiest. If two stories are used for winter, we may find the lower one so destitute of honey that it is of but little use, unless we follow the method of the Canadian leaders, who give the bees sugar syrup in order to get the brood-combs well filled. It is very important to attend to this matter before cold weather, or as soon as the crop shows signs of terminating.

How much is needed for good wintering and spring breeding conditions? Many of the treatises say 25 pounds. This amount may be sufficient, if the early flowers yield plentifully in spring. But if, as we see it often, the spring days are unfavorable, the above amount will prove inadequate. We prefer as large a winter store as 40 pounds, for a good, strong colony. If they have plenty they will not shirk their breeding and will give us better returns the following summer.

If the hive is crowded with too much honey, in early September, it will prove beneficial to remove one comb from the center of the brood-nest to allow the queen some laying room.

We need a good force of young bees for winter and a large amount of stores, close to the cluster.

Failures

We would caution our readers against ordering bees or queens from old advertisements unless they make sure that the parties are responsible. We have found it necessary to refuse the advertising of several who have failed to make good their agreements. We try to use every precaution to ascertain that our advertisers are responsible, but some who have furnished satisfactory references at the start have failed. As soon as we find an advertiser to be dishonest or unable to meet his obligations promptly we refuse his advertising. Some breeders have discontinued advertising because they already have more business than they can care for; others have been refused space. Orders from current advertisers are most likely to receive satisfactory service.

Honey Prices

There are too many producers who are unable to see that it is worth something to sell honey. The man who enquires the wholesale price and then proceeds to sell to his neighbors at about that figure is doing all within his power to ruin the market. The bottler must get enough above the price he must pay to cover the cost of freight, labor, containers, labels, advertising, rent, etc., and to provide a living beside. If he finds the producer is selling at retail at about what he must pay for honey his only recourse is to lower the price. If the producer meets this condition by again selling at retail at about wholesale prices the market again is depressed until ruin faces the business.

The cost of bottling and selling honey is heavy. Unless the producer is willing to sell his honey at retail at prices which will enable the bottler to live, he should sell his honey in a lump in the wholesale market.

The only hope for a prosperous industry lies in maintaining a sufficient margin between wholesale and retail prices to furnish an inducement for good men to make a business of developing the honey markets.

Mould as an Enemy of Adult Bees

In the present number our readers will find the translation of an article from an Italian magazine, upon the work of the Swedish scientist, Turesson, who is attempting to prove that the so-called May disease, of the adult bee, is due to a fungus of mould.

The reader will notice that the writer of the article in question makes light of the nosema, as a bee disease. We suggest that the trouble lies in believing that all the diseases of the adult bee may be condensed into one. Yet it is sufficiently proved that, among these diseases, paralysis, vertigo, Isle of Wight, constipation, some are more or less contagious, while others are light, of short duration and unimportant. It seems, also, to us, that when the stomach of bees is coated heavily with the nosema, of which examples have been shown in our July number, there must be a very positive diseased condition, and that Dr. White is right when he specifically describes that condition as "nosema disease."

But the Turesson experiments appeal to us. The so-called paralysis which we see constantly, in spring, in our Northern States, comes at a time when the weather is damp, chilly and favorable to the production of a musty condition within the hive. So, as long as our knowledge of the cause of these diseases amounts only to a number of interrogation points, let us not discard any suggestions until the arguments and the facts given are pumped dry. Experiments are valuable and valuable are the men who know how to properly conduct them.

Horticultural Complaints

It appears that in a town in Algeria, the City Council lately passed a resolution condemning beekeeping in the vicinity, because the bees deteriorate fruits through the removal of the honey from the blossoms. They hold that this affects the flavor of the fruits, and renders them tasteless. What next? (Nahhla).

SOLDIER BEEKEEPERS

By E. F. Phillips

SOMEWHERE there are statistics to show that a large proportion of the men engaged in the retail grocery business fail. Not being interested in the grocery business except as an ultimate consumer, I have not taken the trouble to verify this statement. However large the per cent of failures in the grocery business, it is fully as large in beekeeping, with one important difference. When a grocer fails he soon finds it out, but thousands of beekeepers are miserable failures and never do make the discovery. This is absolute proof, of course, that beekeeping is a branch of industry well worthy of effort, for if one can fail and still keep going it speaks well for the returns to be attained under the right management.

Because of the uncertainty of success one should hesitate about urging anyone to take up beekeeping. The uncertainty is not so much in the secretion of nectar, although, as every beekeeper knows, this varies more than we might wish. Yet we have all perhaps seen innumerable instances where the good beekeeper gets a crop when other beekeepers all about him experience a failure. The difference is really in the amount of brains applied to the business. Strangely enough, this does not always mean the amount of brains possessed by these persons, for many people do not fully apply to beekeeping the brains which they have. You cannot, therefore, tell in advance who will make the good beekeeper.

In spite of—or perhaps because of—a considerable amount of experience in answering questions of beginners and of trying to guide them through the early days of beekeeping work, I never try to help a beginner without a feeling that perhaps it is the wrong thing to give encouragement to a new beekeeper, who will, according to the law of averages, stand about one chance in a hundred of doing anything really worth while in beekeeping. But it is not my fault if they fail to apply themselves to this work, to study the literature, and especially to study their bees. If all teachers worried too much about the use to be made of the subjects taught, we probably would not have any schools, and all that any teacher can do is to do his best.

There is, however, another angle to the teaching of beekeeping, and that is the danger from the average small beekeeper. Apiary inspectors are almost unanimous in condemning amateur beekeepers and farmer beekeepers, making almost no exception to a universal condemnation, and anyone who tries to clean up an area of either brood disease will probably feel the same way. Commercial beekeepers, may their tribe increase, usually feel the same way about the beekeeper with a few colonies, partly because of the disease situation, partly because so many markets are temporarily injured by ignorant marketing of honey—and partly on general principles. The way of the amateur is a hard one, and yet probably every reader of this journal knows one or two, perhaps more, amateurs who are really better beekeepers than most commercial producers.

In this hasty and unsatisfactory manner I have tried to show why it is far from wise to do anything to increase the number of amateur beekeepers in the United States. We have already more beekeepers than we need—ten times over, perhaps. It is true that we need ten times the the present number of good beekeepers, but the wise policy at present is to make better beekeepers of those now in the work, rather than to try to make more beekeepers. This has been the policy of the Bureau of Entomology, and I hope it will continue to be so for many years.

There is one outstanding exception to this, however, and it is about this class of persons that I want to write. There are many men returning from France who have suffered some disablement, disqualifying them for the work in which they were engaged before entering the army.

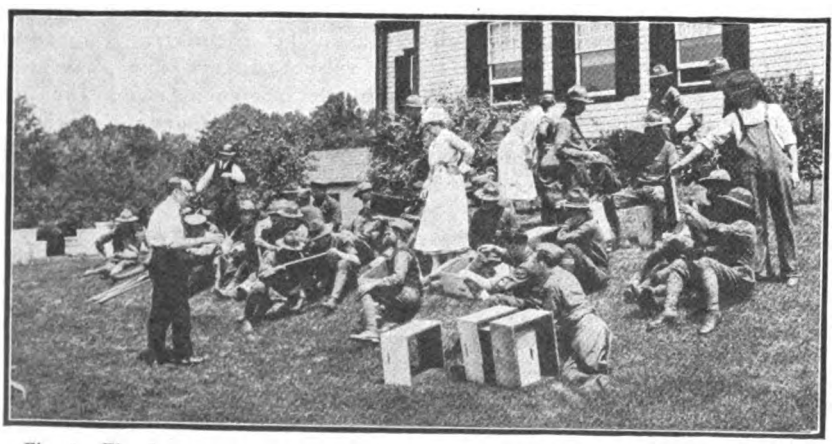


Fig. 1. The first lesson in beekeeping. The hive-bodies were brought out for seats, but the men preferred the grass

Fig. 2. He thinks they are German bees.

While a commercial beekeeper needs to be in fine physical condition to do his best, it yet remains true that the most important part of a beekeeper is the part above the neck. If, therefore, there are some of these disabled men who can better find themselves in beekeeping than in other lines of work, if they manifest the right kind of interest and show a disposition to study the business, I, for one, shall be glad to see them take up the work, and shall be delighted to see them enter the ranks of commercial beekeepers. We owe these men a debt which we can never fully pay, but if we can make their lives better and happier by helping them get a start in commercial beekeeping, there should be nothing but the best of co-operation from the commercial beekeepers of the country.

The Government, through the Federal Board of Vocational Education, offers disabled men training in whatever lines of work they decide upon for re-education. If they choose beekeeping they may go to some school or college where a good course is offered, and every possible aid will be given them during the period of training. Unfortunately, not all the agricultural colleges offer good courses in beekeeping, but this important work is rapidly increasing.

Just as an experiment, the Bureau of Entomology recently invited some of the boys from the Walter Reed General Hospital in Washington out to the new Bee Culture Laboratory in Somerset, Maryland. They came

Fig. 4. Into a machine gun nest. Captain Deming, of the Reconstruction Division at the right

out in trucks and automobiles furnished by the Red Cross and were under the direction of the Reconstruction Division of the Army. On their arrival they were given a demonstration in handling bees, with a discussion of the life history of the colony and a brief talk on just what it is that the beekeeper has to do. At first they were given frames to handle from which the old bees had been removed, so that there would be no casualties. A few of the men who had been through gas attacks and barrage fire took to the bushes, but most of them stuck it out, and their courage increased as time went on and no fatalities occurred. Then they were taken to the apiary—without veils, because the supply which had been ordered had not arrived—and some honey was removed from the hives. A small extracting outfit had been set up out in the open and a few gallons of honey were extracted. A movie man came out for the occasion, and I think he tried to get a picture of that operation. If any real beekeeper ever sees that movie I trust that he will not think that we advocate the methods there shown, for it was difficult to uncap artistically with a few dozen hands ready to catch the cappings as they came off the knife.

Perhaps the most interesting part of the afternoon for the more timid men came after the honey was in a bucket, for the women of the local Red Cross unit then appeared with hot biscuits and coffee and we went back in the grove beside the house and re-stored that honey.

The accompanying illustrations give an idea of the good time and serve also to show something of the character of the new house and grounds used for the Bee Culture Laboratory and apiary. The date was May 27, and while there were some supers on the colonies more were added later. The bees were really ready for more then. Note the fine windbreak of the apiary and the arrangement of the colonies in groups of four for convenience in winter packing. And if the reader has any qualms about the making of too many beekeepers, or any selfish ideas about keeping the beekeeping business all to himself, please note the poor fellows with one leg. One man had his jaw shot to pieces and it is being rebuilt; several had a hand off and there were other injuries which do not show in the illustrations. Perhaps the question may be raised whether disabled men can handle bees successfully, but this has already been answered by those who in spite of such disablements have made a success of commercial beekeeping. Of course, most of our guests will not go in for beekeeping, but there are many more who were not with us on May 27.

Among the illustrations is one of the Bee Culture Laboratory at Somerset, Maryland (cover.) It needs no discussion to show that this is more comfortable than an office in the middle of Washington, and it is right by the bees. The office was moved here on February 1, and the bees were also moved at that time, which is somewhat unusual. However, the moving did not start brood-rearing, as was feared, for there is nothing worse for a colony than to have brood-rearing start out of season. It took careful moving to prevent this. After the moving only part of the colonies were re-packed, but the weather was so mild that no harm came to the unpacked colonies, and they are all busy storing honey.

Washington, D. C.

Fig. 3. The boys who had been "over the top" were not too sure of themselves among the bees

Cellar Wintering

THE following letter may prove interesting to many who practice cellar wintering. Although it is probably best to spend the most of our space in trying to tell beekeepers how to winter their bees, an occasional report of failure may prove beneficial. The writer of the following, received last May, prefers to keep the incognito, but we can vouch for his veracity:

"For many years I have had both a home and outyard of bees. The home cellar where the home bees are wintered, is under our dwelling house,

and has to receive some attention to keep the temperature right. The out-cellar has never really required any attention from the time the bees were put in until I took them out in spring; although I usually visited it once to three times. Both cellars had arrangements for ventilation.

Wanting to spend the winter in Tennessee, I put all my bees in this out-cellar, thinking they would be perfectly safe. My reason for doing this was that no one would be in my home, while I was away, to look after the home cellar. During the summer I had done some repairing at the out-cellar, and when I put the bees in, the ventilators were yet to be put in again.

At our State Convention Mr. —— a representative from the Bureau of Entomology, gave us a lecture, the principal part of it being that they had found a new and much better way of wintering bees than was generally known. He said it had been thoroughly tested and found to be far superior to any other method. He said if the temperature of cellar was 50 degrees, the bees were so quiet and comfortable and in such a dormant condition that they required very little oxygen and wintered very much better with all ventilators closed perfectly tight than if given air. I remembered that Doolittle said the same thing years ago. The cellar must be at that temperature when the bees were put in. I never until last fall had my cellar so warm as that, when the bees were put in, but it was this time. Heretofore my home cellar would always get up to that the latter part of March, and I would have to take them out early, for they got uneasy.

Being anxious to leave my bees in perfect condition while away, it appealed to me quite strongly. I had a talk with him about it and told him of my intended trip and how my cellars were, etc. He said to shut it up perfectly tight and all would be so good I would never give ventilation again. Then I talked with Prof. ——, who, though not a man of much experience with bees, said he was going to winter our State University bees that way, and said he knew that was the proper way to do. Being in a hurry to get off to the South, and as this would save me a day's work from putting in ventilators, I yielded my judgment and experience to theirs and "bottled my bees up tight" and made for the Southland.

The outside temperature has never materially affected that cellar, and I have had that many hives in it before. The temperature was just 50 degrees.

We had our cold week just after January 1, which was the coldest spell we had this winter. Immediately after I left, the 13th, it warmed up and was warm all the while I was gone, but I cannot see why this should have affected the cellar much, being three feet under the ground. There is three feet of earth over the top. It is true we had the warmest winter we ever had, and possibly it made some difference.

The first week in February I wrote to a man to go in the cellar and report conditions to me. He wrote the bees were several inches thick on the cellar bottom. I went home from Nashville as quickly as possible, which was about the middle of February. I never saw such a sight and hope to never again. It seemed the bees could smell a little air coming in around the door and had deserted their hives and gone towards the door until the hives nearest it had bees four to six inches thick on the fronts, and many hives farther back had not a bee in them, and the cellar registered 62. I shoveled up about eight bushels of dead bees and opened the ventilators and the cellar cooled down to normal, and after that but few bees left their hives. As a result, the hives that had any bees in when I removed them from the cellar had from a cupful to a pint, or a little more, to a hive. The weather has been extremely hard on even strong colonies, and at present I have, from 109 fine colonies last fall, probably 20 to 25 three-frame colonies to start beekeeping with again.

I cannot say what the result would have been if there had been cold weather instead of warm, but this I know, I shall let well enough alone hereafter and experiment on a smaller scale. Had I been at home and wintered as usual I am positive my bees would be in fine shape now.

It is impossible for me to have any clover honey this year and I can only run for increase and get my number as far as possible by fall.

Prof. —— wrote me that most of the University bees were gone with dysentery. I wonder if it was that or want of air."

Fig. 5. "Chow" back in the grove, served by Red Cross

Large Hives Again

YOUR large brood-chamber propaganda is attracting considerable attention in this State and I find a number putting in a few Jumbo hives this year for a test.

In discussing this large brood-chamber matter with President Barclay, he said he understood that if you were starting anew you would use the Jumbo depth Hoffman frame. I did not get this from your talks. Is it true?

E. G. CARR, New Jersey.

You are both right. I do not think that I would take the Jumbo hive for my standard, if I took in consideration nothing but my own system.

But, in consideration of the existence of the Langstroth hive length all over the United States, I did say that if we were to begin over again, we would use the standard length of the Langstroth hive, with the depth of ours, which is the Jumbo size of frame.

However, I want it made very clear that I do not at all relish the spacing of the standard frames and of the Jumbo, i. e., the 1⅜-inch spacing. Never did I realize better than I have done for the past two years that the 1½-inch spacing is very superior to the narrower. I said and wrote, and am willing to repeat to as many as will listen, that the 1⅜ spacing is a promoter of natural swarming. This idea is not my own originally, it was emitted by Allen Latham, but it struck me as evidently true, because we had for years used the wide spacing and had been successful in avoiding swarming, without thinking of the influence of it upon that feature of bee behavior, while others who tried our method, but with the narrow spacing in their hives, found the method inadequate. I secured these ideas concerning the wide spacing, from Mr. Latham immediately after attending your New Jersey meetings, in 1916.

The wide spacing allows ⅛ inch additional space between each comb, through the height and length of the hive. This space, ten times repeated, between each of the ten frames makes a space of ten-eighths, or 1¼ inches, which multiplied by the length and the depth, give us something like 170 cubic inches of additional space, breathing space and ventilating space, when the hive is full of brood and bees. When the hive is filling with honey, it adds several pounds of honey above the brood, just where it ought to be, because the bees do not need all the space to travel through and therefore narrow it down by lengthening

the cells. But when the breeding season comes again, those cells are shortened to the proper length for breeding, and that is when the bees need the ventilation and the room. In winter more bees cluster, between the combs, under the honey than in the narrow spaces, and the wintering is better. No one has yet been able to overthrow this position.

This discussion of large brood-chambers has been practically forced upon us, by enquirers, and has been especially urged by Frank C. Pellett, who became enthusiastic over our methods when he joined the staff of the American Bee Journal.—C. P.Dadant.

Do Ordinary Cryptogams Cause May Disease, Wing Paralysis and Trembling of Bees?

THE knowledge concerning the diseases of adult bees is at present very precarious, said Dr. Morgenthaler, a member of the Bacteriological Institute of the Liebefeld, near Berne, and since the causes are not positively known, their diverse forms are not easily distinguished from one another. It is not known whether the ordinary symptoms—swollen abdomen, inability to fly, trembling and darkening of color, which appear isolated or combined—belong to one and the same disease. The discovery of parasites made by Zander has not yet supplied the expected explanation.

The great interest which all beekeepers take upon this question of mortality of bees, in large numbers, sometimes causing complete destruction, justifies the analysis of the work of Turesson.

This Swedish author, in experiments made in 1916, examined the toxic action of cryptogams upon man and mammiferous animals. He found that certain fungi which are very common may exercise a poisonous action, more or less powerful, upon the organs. In rabbits, fed with cultures of different cryptogams, he noted the following symptoms: At first, irritation of the nervous system, which manifested itself with trembling and spasms, a greater cardiac activity; then a weakness to such an extent that they could not stand upon their legs; finally paralysis and death. Paralysis attacked also the digestive tube, in such mode that the intestines could not discharge anything, and a constipation was produced which caused a great dilation of the stomach and of the rectum. Turesson thinks that too little attention has been paid in the past to the toxic influence of cryptogams and that, for example, some of them cause cerebro-spinal meningitis of domestic animals.

Their toxic action is due to the fact that these fungi produce substances related to phenic acid and have much analogy with the acids of lichens, which are also poisonous for various animals. The resemblance of the morbid symptoms described, with those often observed in the diseases of adult bees, induced Turesson to examine more closely the influence of nutrition with the fungi of mould. He enclosed about a dozen bees in each of 13 cages sufficiently roomy and fed the ones with honey mixed with a determined amount of various fungus of mould; the others, to serve as checks, with pure honey. The result was that one species of fungus, after 3 days, the others after 4 and until 8 days, had killed them all, while those fed with pure honey were still in good condition. The dying or dead bees had nearly all a swollen abdomen, caused by a plethora of the stomach or intestine; presenting therefore the symptoms of the May disease; only with the fungus that had caused death in 3 days did the bees appear to have a normal, non-tumefied abdomen, because in that case the venom had acted too speedily and the bees had died before having absorbed a large amount of food. The other symptoms of the malady were as follows: Paralysis of the wings, unsteady walking and trembling. The bees often rubbed their abdomen with their legs and thus acquired the shiny black color.

Five different fungi were employed in the tests; 3 species of the genus **penicillium,** the ordinary **mucor mucedo,** and the **cladosporium herbarum,** a frequent fungus which belongs to the black fungi, and had been produced in part on dead bees and in part on combs of honey. It is probable that other kinds may be found of varying toxicity and even more poisonous; the different species are of variable toxicity and it is even possible that some subdivisions of the same species may behave in different modes, and that a fungus may be fairly lenitive in one region, while the same variety becomes virulent in another, by a greater production of poison. Thus, according to Turesson, the question is not, in regard to the mortality of bees, of a properly called infection, or of parasites the germs of which develop in the body of the individual bee, but of an intoxication by means of a chemical poison. In such a case the poison does not remain within the fungus, but is transmitted to the body upon which it acts.

It is therefore possible that even sweetened water in mouldy combs be poisonous, even after the fungi have been removed. The toxic substance is not destroyed by the heat that may melt combs. The fungus of mould does not develop on virgin combs; on the other hand, every beekeeper knows that a mode of production of mould are the used combs, which are sometimes kept in an ill-ventilated closet.

The moist heat which predominates within the colony is favorable to the development of fungi. The bees must certainly use great cleanliness to avoid mould in their home and they need also ample ventilation of the hive, in summer and winter. The fall feeding with sweetened water should not be provided too late, because at that time the food cannot be sufficiently condensed, from which an increase of moisture is produced. The combs hanging in winter outside of the cluster are especially exposed to the possibility of moulding. This is one of the reasons why the symptoms of poisoning are more particularly and more frequently manifested in spring, when the bees begin to use the food in those combs, or even if they only polish them with their tongues.

This is, in brief, the summary of the work of Turesson, who believes he has discovered in the fungus of mould the cause of the May disease, of paralysis of the wings and of the trembling. Although mould has been considered bad and noxious by beekeepers, this work exposes some viewpoints that are quite new, to judge of its influence upon the mortality of bees in large numbers. The future will demonstrate whether his opinion is just, or whether, as with the nosema, the toxic influence of the mould is not too much dwelt upon. The experiments made with bees in cages are not sufficient to elucidate the matter; it is necessary that the experiment should pass through the observing of the apiarist. The imprisoned bees find themselves in abnormal conditions and the evidences upon the perturbations of digestion should be judged with increased care. In fact, a normal bee, aside from her love of cleanliness, will avoid discharging her excrements in the hive, or, in this case, in the cage; this alone is already sufficient to disturb the digestive functions from their natural process. It is true, on the other hand, that the checks made, by feeding some imprisoned bees with pure honey, who remained healthy, bespeak in favor of the Turesson opinion.

It would be most important, I believe for beekeeping, if it was confirmed that the mortality, in large numbers, of the bees, be by intoxication and not by infection produced by bacteria or by nosema; this especially in my opinion as regards the cure. In the apiarian publications are found frequent reports of favorable results obtained with curing liquid remedies. The British Bee Journal interests itself exhaustively in this question. Each number of the past year contains one or more articles giving proofs, whether successful or not, of cure of the Isle of Wight disease, which yet remains unexplained and is very disastrous. The results were lately so favorable that their Department of Agriculture took interest in the matter and offered a remedy that was recommended, Bacterol. Since the nosema was for a long time considered as cause of the disease, one could reasonably doubt the efficacy as cure of a chemical substance, since these spores are much more resistent, against such an influence, than the intestines of the bee; it would seem rather strange that a remedy might destroy those spores without being noxious to the bees in any way. Lately, it has been demonstrated, by Anderson and Rennie, that the Isle of Wight disease has nothing to do with the nosema.

In some other countries, also, the wholesale mortality of bees has been charged to the nosema, of which it is difficult to give an explanation, because this parasite is not always present in the dead bees. On the other hand, its propagation in healthy swarms has damaged its fame as a dangerous germ. I do not believe that the nosema deserves the interest of those who occupy themselves with bee diseases.

If it becomes established that the cause of the disease is not a resistent micro-organism, but a definite chemical substance, similar to phenic acid, there will be, already, a great possibility of obtaining, at least in light cases, an improvement and a cure through an antidote administered under shape of liquid remedy. The work of Turesson opens, therefore, a favorable field for observation and experiment.

However, the best prophylaxis, against diseases, must not be sought, in one case or the other, among chemical substances, but in a well-managed hygiene of the bee hive, making it a salubrious home for the bee, by rational management.

(Translated from L'Apicoltore Moderno, of Turin, May, 1919.)

Boys and Bees

IN all my experience of high school teaching, I have never found a more ideal combination of work and play than in my course in Bee Culture, which I am conducting in the Montezuma Mountain School since the summer of 1918.

The enthusiasm and thoroughness with which my students work in the shop and laboratory, as well as around the bees, is evidence enough that such a course is a desirable feature in high schools of the Montezuma type. Such a course can easily be made a subject of highly scientific merit as well as of practical value, as it keeps our boys busy and interested all the time and brings them closer to nature by our frequent afternoon excursions to my different outapiaries, which are located in the neighborhood of the school.

WILL C. STEINBRUNN,
Los Gatos, Calif.

Introduction of Virgin Queen

By Elvin M. Cole

IN Dr. Miller's Answers, page 19, of the May Journal, "Wisconsin" asks what to do with pollen-clogged combs.

I suggest this plan: With the end of a knife or hive tool, scrape the pollen-filled part of the comb down nearly to the mid rib on both sides if necessary. With combs that are slightly brittle there is little danger of making a hole in the mid rib, and both sides can be scraped in about a minute. Give them back to the bees during a honey-flow.

Tough, leathery old combs may be easily cleaned on one side in the same way, but it requires care when cleaning the opposite side; however, most combs will be badly loaded with pollen on one side only.

After starting tough combs with the knife, the cells may be peeled from the base with the fingers.

I have had but little experience in introducing virgin queens as discussed by Dr. Miller, page 17, January, and Wm. Atchley, page 170, May, American Bee Journal. But G. M. Doolittle goes quite deeply into the subject in Scientific Queen-rearing, and gives the law that governs the action of bees toward a virgin queen. It is in scattered paragraphs on several pages and two chapters, and requires careful reading to get it.

The "basic law" is the same as in Mr. Atchley's plan, and the plan used by Mr. Alexander for introducing two or more queens to a colony. I believe it is the only method of introduction which Mr. Doolittle claimed to have originated. He shook bees into a box and left them for 3 or 4 hours, or until they realized that they were hopelessly queenless, then dropped in a virgin queen of any age. In hiving them in the nucleus box, he says, page 61: "Do not give them any unsealed brood, for if you do they will sometimes kill the queen and rear cells from the brood given. It is not natural for a colony to have an oldish virgin queen when they have eggs and larvæ, for in nature all brood would be sealed before the young queens were three days old."

In introducing to a nucleus from which a laying queen had just been taken, he took away all brood and gave her a cage which allowed the bees to release her in 8 to 12 hours, by which time they would realize they were hopelessly queenless without her.

On page 87 Doolittle says: "For in nothing are bees so determined as they are not to accept a virgin 5 or more days old after having their mother taken from them. I have never lost a queen in this way, no matter if she were 12 days old when placed in the cage, and I consider it an absolutely safe plan for introducing a virgin queen."

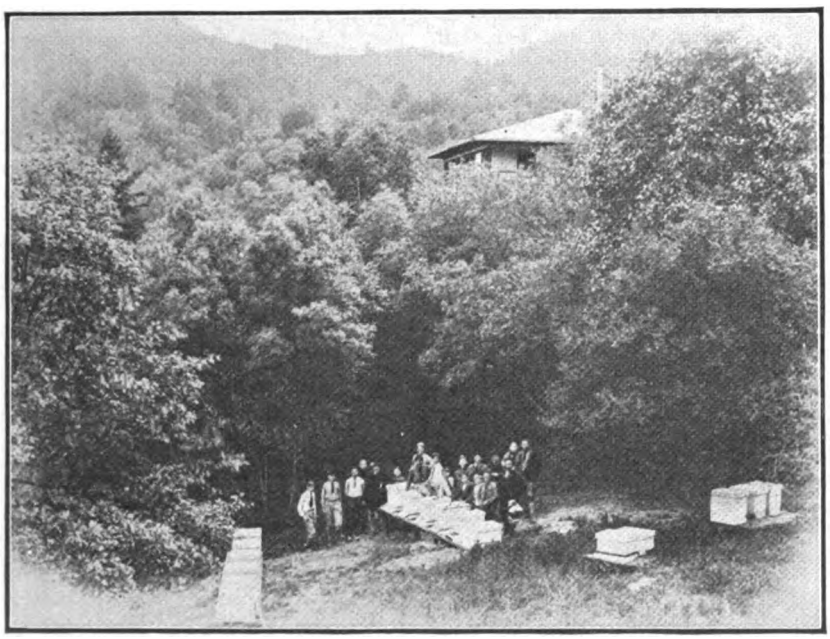
Mr. Doolittle considered this plan of introducing laying queens to hopelessly queenless bees to be infallible, and says, page 80: "I have used this plan with all valuable queens for several years, and have not lost a single queen, nor do I believe that I ever shall lose one."

It would be a great help to young beekeepers if you would "lift out" the different paragraphs giving this "hopelessly queenless" method of introduction and print them in consecutive order.

I consider Scientific Queen-rearing the most interesting and helpful bee book I ever read, and I have read most of the modern ones, even though I never expected to rear a queen by that method.

About every so often you may count on seeing some of Mr. Doolittle's ideas yanked out of this book, a few unnecessary frills added, and given to the beekeeping world as something new; as witness: Alexander's plan for introducing plural queens (which is this hopelessly queenless method), A. C. Miller's smoke method, Baldwin's dipping the queen in honey, Atchley's introduction of virgin queens, etc. Verily great was G. M. Doolittle.

Audubon, Iowa.



A students' apiary at Montezuma Mountain School, under Prof. Will C. Steinbrunn, at Los Gatos, Calif.

A Little Pioneer History

A WAR song, famous in its day in Marion County, has been revived and will be sung in the celebration of the 100th anniversary of Marion County's birth, in Palmyra this month by the sons and daughters of soldiers who left Palmyra in 1839 to begin the first civil war in the west between Missourians and Iowans. It was called the "Honey

War." The dispute, which was over a 12-mile-wide tract of wild timber land, foreshadowed the mighty conflict that two decades later hurled Missouri and Iowa men, tiger-like at each other's throats.

In the disputed territory were many bee trees. This gave its name, the "Honey War," for both the pioneers in Iowa and Missouri adjacent to the strip coveted the privilege of cutting the bee trees and securing a supply of "sweetnin." Men of a later age, who find sugar in every store, may not be able to understand the fight for the wild honey, the only source of sugar then for household use.

Foreshadowed Civil War

Despite its title and absurd ending, deeper reasons led Governor Lilburn W. Boggs, of Missouri and Governor Lucas, of Iowa Territory, to call out the militia of State and Territory to march to repel invasion. "Black Ivory," not golden honey, was the real issue. Some pioneers in the section held slaves, who would be freed if Iowa gained possession of the strip. Their fellow-slave owners in Missouri were in full sympathy with their desire.

In August the sheriff of Clark County, was taken prisoner by Iowa militia when he was tax collecting in the disputed strip. This stimulated the war spirit, and in November Governor Boggs, of Missouri, called out the State militia. Gen. David Willock, commanding the 14th Militia District, a Palmyra man, and Gen. O. H. Allen, of Lewis County, were ordered to take the field. Col. John Lear, of the 56th Regiment, M. S. G., and Capt. Thomas P. Stewart, of Palmyra, called for volunteers to augment the regular forces, and as the drum beat, the long roll Palmyra men with rifles and horses responded. Soon 2,200 militia and volunteers were on the march for Iowa, with more than 50 men from Palmyra. In the same spirit the Iowa "free soldiers" rushed to arms and moved out to hold the debated ground.

Off to Waterloo

December 12 the Marion County men started for Waterloo—ominous name—in Clark County. The first night was one of torture. Assailed by rain and snow, without camp equipment and supply wagons on Upper North River, huge log fires alone saved the men from freezing. Another day's march in the slush roads and icy winds brought them to another camp as bleak and forlorn as the first stop.

In this camp, on the Troublesome Creek, the peace messengers came. Col. Thomas L. Anderson, F. H. Edmonson and S. M. Grant, Missouri diplomats, met William Patterson, Dr. J. D. Payne and L. B. Hughes of Iowa in Waterloo and reached an agreement for the armistice. The commissioners decided to appeal to the United States Government to decide the sovereignty of the honey lands.

Governors "Labeled and Shot"

Disgusted with the tame ending to their plans for martial glory, the Marion County men opened up a barrel of whisky, hung two haunches of venison to trees labeled Governor Boggs and Governor Lucas and filled them with the bullets that they had planned to use in winning the Honey War. When they marched back to Palmyra many of the men turned their coats inside out and all sang the rollicking lines of the Honey War song.

Lewis County men were harder to appease. A convention was held in Monticello and fire-eating orators denounced the commissioners, the governors and everyone else who had prevented a civil war. A year later the United States awarded the honey lands to Iowa, and it is noteworthy to recall that this award was made on the recommendation of a Capt. Robert E. Lee, who made the survey in 1837, and who, 25 years later, was to win immortal glory when he led the Missourians in another and far bloodier civil war.

The Honey War Song

The Honey War was ridiculed in a poem written by a Palmyra rhymster, and it was sung in disgust by the troops who returned from the bloodless war. The poem follows:

Ye freemen of a happy land,
Arise! To arms! Your ponies mount!

* * * *

Regard not blood or money,
Conventions, boys, now let us hold;
Our honey trade demands it.
Likewise three bits, all in gold;
We all must understand it.

Now, if the governors want to fight,
Just let them meet in person.
And when noble Boggs old Lucas flogs,
'Twill teach the scamps a lesson.
Now let the victor cut the trees
And have three bits in money,
And wear a crown from town to town
Anointed with pure honey.

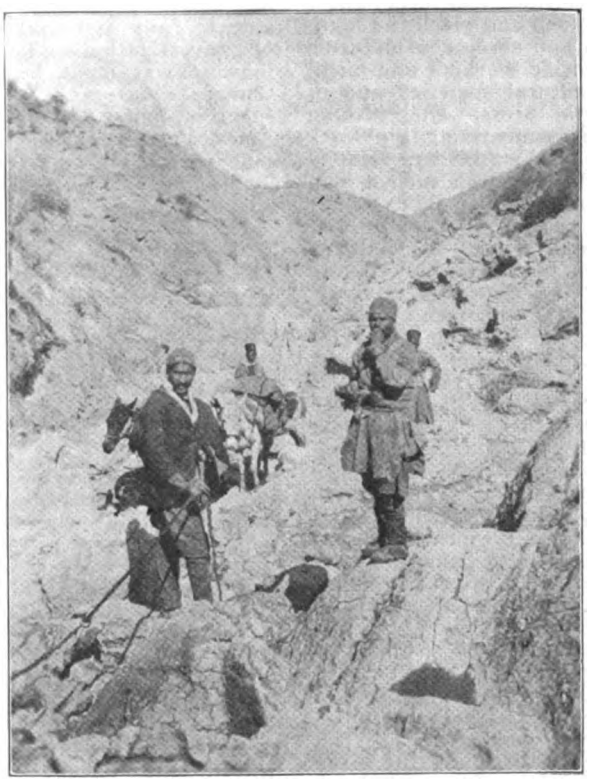
* * * *

Our honey trade will then be laid
Upon a solid basis.
And Governor Boggs, wher'er he jogs
Will meet with smiling faces.

—St. Louis Republic.

Benton's Travels

EARLY in 1880, Frank Benton went abroad, where eleven eventful years were spent in travel and study, and in investigating the honeybees of Europe, Asia and Africa. Apiaries were established on the Island of Cyprus and in the Holy Lands at Beirut, Syria. In the winter of 1880-81 Ceylon, India, Farther India and Java were visited and extensive collections and studies were made of the native bees of those regions. It was on this expedition that the "jungle fever" was contracted, which ultimately claimed its own, but only after many years of active service had intervened. The winter of 1882-3 found Dr. Benton a student at the University of Athens, and the years 1884-86 were spent at the University of Munich, where he all but completed his work for the doctorate. He was granted the Master of Science degree by the Michigan Agricultural College in 1885 in view of his studies abroad; and some years later the degree of Sc. D. was conferred upon him by the Oriental University of America for similar studies. During the years spent in Munich several trips were made to Cyprus and Syria, and on one occasion Tunis and the African coast were visited and the bees of these regions studied. Italy was visited by



Benton caravan crossing Persia, in 1906

the way as was also the little province of Carniola, in southern Austria, with the result that the four years from 1886-90 were spent in the fastnesses of the Carnic Alps in investigating, breeding and giving to the world the docile bees native to these mountains.

In 1890 Dr. Benton was commissioned by Dr. C. V. Riley, the United States Entomologist at Washington, to proceed to the Orient for the purpose of carrying on further investigations of the giant bees of India, and to study and import the Blastophaga wasp from Smyrna in the interest of establishing the Smyrna fig industry in California. Unfortunately, this commission passed Dr. Benton on the high seas, as he had already sailed from Hamburg for New York in December of 1890, after an absence from his native land of eleven years.

On his arrival in America Dr. Benton was offered a chair in modern languages at Cornell University, and at the same time came an offer from the United States Government to go into scientific work at Washington. It was not an easy matter to decide, especially for one so rarely gifted in both fields of endeavor. But at the parting of the ways Dr. Benton, at the age of 39 years elected to go into scientific work, thereafter becoming only indirectly identified with academic life as an occasional lecturer. He proceeded to Washington in July, 1891, the proposed trip of exploration abroad being held in abeyance for the time being, and fourteen years intervened before this second journey was finally undertaken.

It was not until June, 1905, that Dr. Benton finally undertook his second tour of apicultural and botanical exploration which became a world embracing expedition, and everywhere he was welcomed and given the highest attention and every consideration by both scientific workers and members of apicultural societies and of the apicultural press. One leading periodical in summarizing his work closed with the statement, "Happy America that can speed **such** a man on **such** a journey!"—an index of his appreciative reception abroad. The overland route through the Balkans to Constantinople was followed and from thence the Caucasus was visited, where, in spite of the Russian revolution of that year, much data of value was collected, and representatives of the Caucasian races of bees imported. During the height of the revolution the Bishop of Armenia extended to Dr. Benton the hospitality of his monastery at Erivan, where Dr. Benton took refuge for several weeks until able to proceed to Baku on the Caspian Sea, from which point the long journey inland through Asia was started. Turkestan and Bokhara were visited, from where was imported the Turkestan melon, now becoming extensively grown in this country as a table delicacy. Turning southward, Dr. Benton organized a caravan, traveling a thousand miles through Persia, reaching Teheran early in January, 1906, and India the fore part of March. During the

Frank Benton

next seven months every part of India was visited, from Quetta in the northwest to the jungles of Assam, from the plains of Jubbulpore to the Himalayas of Simla and Darjeeling, and extensive studies made of the native honeybees which were captured and kept under observation in experimental hives. The guest of His Highness, the Maharaja of Kashmir, Dr. Benton had placed at his disposal a herd of elephants and retainers which greatly facilitated the work of exploration that he was engaged in. Finally, in September, the Philippines were reached and several months were spent in a long tour of this thousand-mile archipelago. At Zamboango, in Mindanao, Dr. Benton was very ill with fever contracted in the jungles of Assam, but despite these difficulties he was able to rally and continue his work of investigation. The homeward journey was made by way of the Chinese coast, and some time was spent in Japan, Dr. Benton reaching America early in 1907, after an absence of nearly two years, with his long-planned journey an accomplished fact.

The Barbeau Queen-Rearing System

WE have received a number of enquiries concerning the above system, described in the July number. Although we have not tried it ourselves, owing to lack of time, we are informed that it is quite successful, and the fact that Mr. Barbeau offers it free to the public should not deter beekeepers from the appreciation of it. Replying to our enquiries, Mr. Barbeau sent us the following letter from one of his pupils, who owns several large apiaries. This we translate from the French:

"I am glad to be able to say to you, in answer to your request, that I have well succeeded with your method of producing queen-cells. I raised 700 queens the past summer and obtained 90 per cent of queens from the cells which I produced. With the old method I succeeded in only 35 to 50 per cent of the cases. Your method is better, for it gives less labor and secures more queens.

"The best way to succeed is to have plenty of young bees in the colonies that rear the queens. For that purpose I give the orphan colony some combs of brood ready to hatch.

"To rear queens in time of dearth, it is necessary to feed the queenless hive two days before giving it the queen-cells and continue to feed it for 6 days afterwards, provided it is strong enough."

Yours truly,
O. FONTAINE,
St. Guillaume D'Upton, Q.

The advice to keep the queen-breeding colonies fully supplied with young bees, and fresh food in plenty, is also strongly recommended by Mr. Barbeau and this advice tallies with the experience of all queen-breeders as well as with the recommendations of the writers of all the practical works on bees.

Mr. Barbeau describes 3 methods of queen-rearing by his system, as follows:

First Method. Remove the queen from a strong colony, and allow the bees to rear queen-cells in the natural way. But after 7 or 8 days, remove all the queen-cells, whether finished or just begun. At the same time, shake or brush into the hive, after having smoked it, the bees of 2 or 3 frames from another colony Be sure to locate the queen of each colony so as not to remove her.

Better still, if you happen to have a small swarm, would be to unite it with the queenless colony. The aim, in all this, is to have a large number of young bees to feed the royal larvæ.

Three or four hours after having prepared the colony as above stated, cut out, with the punch, such larvæ as you may wish to use from your best selected colony. Let them be larvæ about a day old, of the size of a lettuce seed. After having removed as many as you desire, 20 or 30, or more, insert them into the cupules and screw these cupules into a brood comb of the queenless colony. At the end of 10 to 11 days, the queens will hatch.

The above method is a little slow, but it is very sure, especially for beginners.

Second method. This consists in removing from the hive the queen and all the combs of unsealed brood. Leave in the hive only 2 combs of entirely sealed brood almost ready to hatch. Add to these also some combs of honey and, if you wish, another comb or two of entirely sealed brood and young bees from other hives. Always be particular to locate the queens of each hive so as not to give them by error to the queenless colony.

Prepare your queen-cells as before and insert them into a dry comb, which you then place in the center of the queenless hive. This comb should be placed into the breeding hive only 3 or 4 hours after having prepared the colony.

Third method. This consists in placing a queen-excluder between the

brood-chamber and the upper story of a very strong colony. For this purpose it is necessary that the colony should fill its brood-chamber and super with bees. If you do not have any colony strong enough for that you must add bees to it a few days previously. Of course the old bees united to it will go back to their home, but the young bees will remain and it is the young bees that are needed to feed the larvæ.

If your colony is of sufficient strength, give it, in the super, two combs of sealed brood, between which you place your comb of cupules.

Should the bees of this colony refuse to build queen-cells out of the cupules, which is a rare occurrence if the colony is strong enough, you can compel them to build the royal cells by removing this super and placing it on the stand of the main brood-chamber, setting the main brood-chamber right by the side of it, but with its entrance at the opposite side, in the rear instead of the front. This operation should be performed early in the morning. The next day you place both hive and super back to their original position, with the super above the main brood-chamber. You will then find that nearly all the cupules are being worked upon. This method is rarely needed to compel the workers to construct queen-cells. It requires a little more experience than the first two methods described above.

To prepare a comb of cupules, take from the colony containing your choice queen, a comb containing larvæ a day old. Carry it away from the apiary to a convenient spot. Then, with the punch, cut out as many cells as you need and place them into the cupules with the "pusher." Then get a comb from your breeding colony and screw the cupules into it. It may then be put back in the center of the hive as stated above.

At the end of 8 days, when the cells are sealed, and the queens getting ready to hatch, build up nuclei, or make divisions, or remove your old queens and enclose your queen-cells in royal cages, so that when they hatch they remain prisoners. Within 2 or 3 days you may release them to be fertilized.

You may introduce a hatching queen in this way in a colony having a young queen ready to be fertilized. Just as soon as she begins to lay, you may remove her and release the other at the same operation. You simply take off the cover of the cage and the bees consume the candy and release the queen. By alternating in this way, you may secure laying queens very rapidly.

E. BARBEAU,

St. Eustache, Quebec.

Introducing Queens

I HAVE no luck introducing queens; have tried every plan I have read of, smoke, syrup, etc., but they kill them; throw them out every time; have removed the old queen and destroyed cells. How long can a queen be kept alive caged, and is it necessary to keep bees in cage with her? The candy melts and drowns them for me in hot weather.

Missouri.

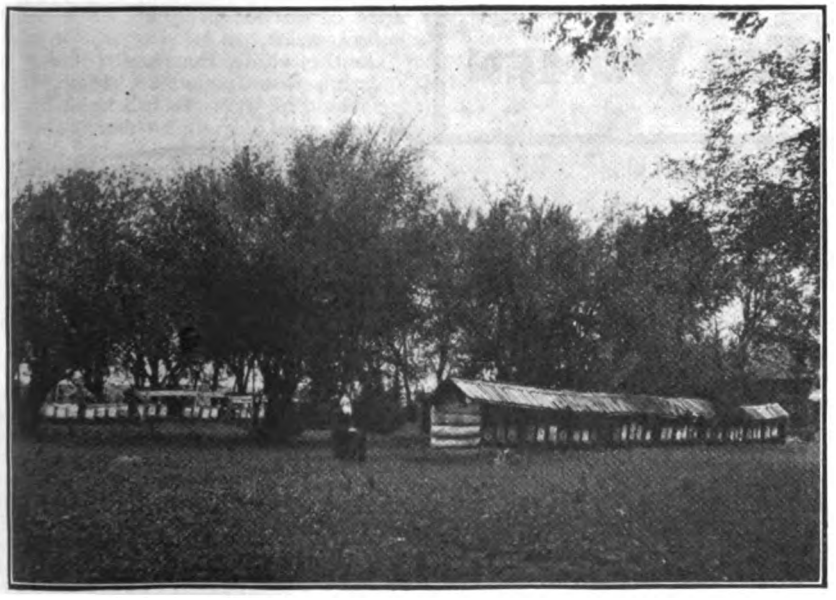
Try the following for the introduction of queens:

Have one of the little flat Miller queen cages that are sold for 10 cents. When you receive your queen or have a queen ready for introduction, remove the queen which you wish to destroy and place her in the cage. Put the cage between two combs in the center of the hive near the brood. After 2 to 4 hours take the old queen out of the cage, kill her and put your new queen, without any of her workers, in that same cage, in the same spot between combs of brood. After 48 hours, release her by placing a chunk of comb honey in place of the stopper of the cage. Close the hive and do not disturb it for at least 2 days. This method succeeds with people who cannot succeed with any of the other methods.

The idea of caging the old queen for a few hours in the cage intended for the new queen is to give the bees the suggestion that their queen is in that cage.

Never kill a queen ahead of time, when you wish to introduce a new one. Better not let the bees know they are queenless for a single hour.

A queen will live a number of days in a cage, alone, if in the middle of the brood-comb.—C. P. D.



Helping make the Kansas prairies produce. Apiary of A. V. Small, at Augusta

One-Story Jumbo or Two-Story L Hives

By Arthur C. Miller

IT was recently my good fortune to examine several score of colonies which were kept on two Langstroth bodies as permanent brood-chambers, and the conditions were not pleasing from an economic standpoint. With scarcely an exception, all the brood was in the upper chamber and the lower chamber contained nothing but empty combs. Some of the colonies had swarmed and others were preparing to. To make matters worse, the combs of the lower body were often badly gnawed. Here was a direct waste of nearly half the equipment, a matter which cannot be lightly passed over in these times of high prices.

When these colonies were prepared for winter last season the brood-nest had been in the lower story and the upper story was fairly full of stores. This spring the owners had simply put on the supers and let the brood-chambers alone, after assuring themselves that the colonies had queens and were prosperous. The few cases where brood was also in the lower story were where the upper set of combs were still pretty full of stores, far too much for profit.

Advocates of the two-story plan will doubtless retort that the owners should have transposed the position of the two bodies or have shifted more or less of the brood to the lower stories. But the owners object to "manipulation" as being too costly. In most of the yards examined there were also Jumbo hives, and these were proving so much more satisfactory that the owners are, as fast as possible, shifting to that style of hive.

In a nutshell, the two-story Langstroth, as a brood-nest, is too big, and not only costs nearly twice as much but is of the wrong proportion and necessitates the handling of twice as many frames when a colony has to be gone through. Theoretically, the bees should not behave so; they should extend the brood-nest downward, because the text books say so. Naughty bees to put such a crimp in the sale of the two-story brood-nests.

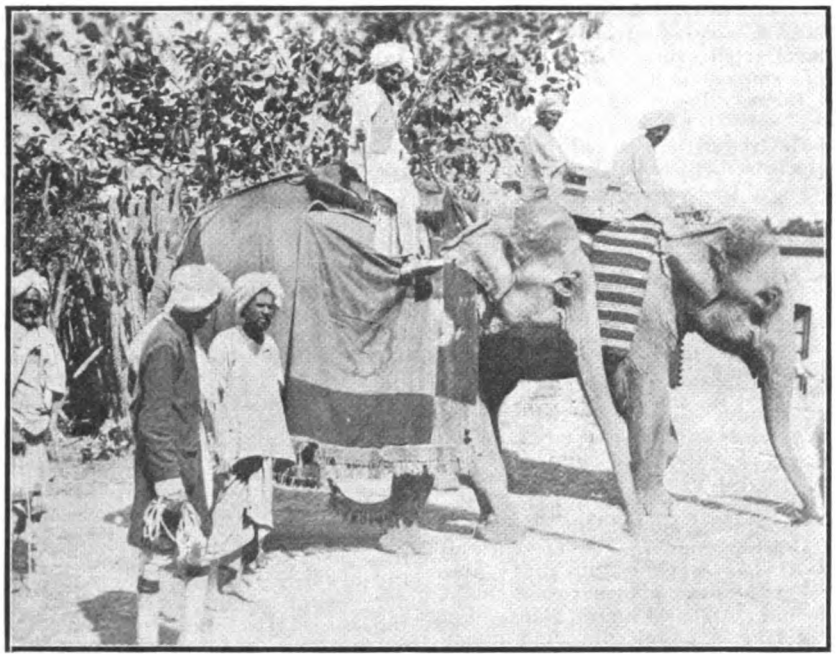
Moses Quinby, the Wise, studied bee behavior and experimented on hive sizes and proportions perhaps more fully than anyone else has, and he finally settled on a hive that has proven itself to be right. The Jum-

bo is, for all practical purposes, the same as the Quinby. It is of the same depth, but about seven-eighths of an inch shorter, but has the advantage of taking all the equipment of the 10-frame Langstroth hive except the frames. Mr. Draper, the introducer of the Jumbo, then known as the "Draper Barns," builded better than he knew when he put the Quinby depth on the Langstroth length. If our supply men would only be as considerate when making innovations we would all be better off and happier. Incidentally the supply men would be less troubled with orders for "special" goods, when often those specials are merely an attempt on the part of the purchaser to get duplication of what he had before, which was "stock" stuff when he got it. I sometimes wish I could get the factory man out on an inspection trip with me and let him see what awful misfits some of the factories "made to fits" are.

Apparently the beekeeping world is shifting to Quinby size hives and the supply men will advance their own interests as well as ours if they will get together and agree upon uniformity of dimensions, so that we may not have the hundred and one variations in the Jumbos which we have in the L's.

Mr. Beeman, just study the behavior of your bees when they are allowed to follow their own sweet way. It may save you a lot of costly labor, called manipulation, and give you greater returns.

Providence, R. I.



Colony of giant bees transported on an elephant
(See Benton's Travels, page 307)

BEE-KEEPING FOR WOMEN

Conducted by Miss Emma M. Wilson, Marengo, Ill.

Selecting Breeders

While examining my colonies I am always watching each queen, trying to determine which one is the best to use as a breeder. But I am always unable to pick out the one that is superior to all the rest. Quite a number appear to be equally good. When looking over colonies this way it is quite difficult to keep in mind the various points that one should consider. It seems to me that there should be some sort of a score card devised to assist one in this work. I believe all other breeders of pure-bred stock have some sort of system they follow along this line. I am fully aware that some of our largest producers do not care about a thing of this kind, but there are many that do. Most of those who do not care discover that they do when European foulbrood hits them. In my apiary inspection work I have made it a point to find out just what our different commercial beekeepers consider a purely mated Italian queen. Quite a number don't know. And nearly all are at a loss to draw the line between dark Italians and light hybrids. We should have a standard to work to. But it seems that it should be the work of several men.

Ohio.

If I understand aright the suggestion of our correspondent, it is that there should be some sort of a score card to aid in deciding the standing of a queen by direct inspection of the queen herself. It would surely be an excellent thing if we could agree upon certain things in a queen by which we could rate her value; but it seems to me that there would be difficulty in the present case.

A judge, or a set of judges, might pass upon a cow in the show ring and arrive at a decision quite satisfactory. But with a queen the case is different. With a queen before us there are three things we can see—size, form and color. What can we tell from these? Very likely most of us would say we prefer a large queen. But is a large queen always better than a smaller one? It looks a good bit that way. When a queen is in full laying a large part of her bulk and weight consists of the eggs contained in her body. If one queen is 10 per cent heavier than another, is it not reasonable to believe that the difference is mostly in eggs, and that the larger queen will be the more prolific layer? Yet I have in mind a queen that I think was the most prolific queen I ever had, and she was remarkable for her small size, perhaps the smallest laying queen I ever had. (I also remember a similar occurrence.—C. P. D.)

As to form, the difficulty would be less. We would probably agree that a trim-built queen with a tapering abdomen is to be preferred to one that is clumsy-looking and bunty. And right at this point, while noting whether the queen were clumsy-looking, we would note whether she were clumsy-acting by seeing how she moves upon the comb, whether in a sprightly manner, or in a slow and loggy way, as if afraid of falling off the comb. The number of legs might also be considered, yet the loss of a leg would hardly affect her as a breeder.

When we come to the matter of color we are very much at sea. We can tell something from the color of a colony of workers, but there seems to be no direct relation between their color and the color of their mother. She may be quite dark, and yet produce a worker progeny of a bright yellow color.

On the whole, the result of our inspection would seem so meager that we would be likely to fall back on the simple way of judging her value by the amount of honey stored by her worker progeny. Indeed, that's not so very different from the case of the cow. Whether the cow be perfect in all the points of the score card, or whether she fall down badly in some of them, if she produces in the course of the year more butter-fat than any other cow in the world, her valuation would run up into the thousands, and she would be called the champion of the world.

In the same way the queen will be judged by the amount of honey stored by her colony, of course taking into account any circumstances that would have a modifying effect on that amount. For instance, if, early in the season, a frame of brood should be taken from one colony and given to another, and then each should harvest the same number of

pounds of honey, the one from which the brood was taken would be counted the better of the two.

The cow is judged by her performance at the milk-pail; the queen by her performance in the supers.

—C. C. M.

(In a foot-note, Dr. Miller asks the management of the Journal to "fight back" if either one of us disagrees with him. We do not see how we can improve on Dr. Miller's suggestions unless it be in recommending to keep out of the score any queen of impure stock, for the reason that, in a hybrid queen, the qualities are probably not fixed so as to insure the reproduction of similar qualities in her daughters. So we would prefer to rear our queens from a pure queen, purely mated, even if there was in the apiary a queen of impure stock whose progeny produced the largest crop.

We would consider as of importance, as well, the gentleness of the bees which the queen produced and their ability to withstand disease. It seems pretty well established that pure Italians resist European foulbrood better than either hybrids or blacks.

But in selecting between queens of the same race or the same degree of purity, we do not see how any one can find a better test than previous results, in honey.—C. P. D.)

Bees Clustered Outside

Dear Miss Wilson :

Madame: Am writing you to see if you can tell me why the bees cluster on the outside of the hives. Am a beginner and this is my second season, but only my first year to notice every move the bees make. I find that the bees have clustered only on my 3-story colonies and I made 4 nuclei this spring and they do not do this. We have had so much rain this past winter, and then it rained again for a couple of weeks last month. Do you think that the reason for clustering so is because there is very little pollen or honey coming in? My nuclei are doing fine, and upon my last inspection I found they had almost no brood; now why? Do you think our excessive rain has anything to do with this. Am very interested in my bees and am afraid I go in my hives too often. Can you tell me how often I ought to enter my hives in order to prevent them from raising queen-cells. Last year I had such a fight with the bee-moth that I keep a close eye on them, but my colonies are very strong, so am sure there is no danger.

Fairhope, Ala.

Bees probably cluster outside because it is more comfortable there, that is, it is cooler. The more bees there are in a hive the more likely to cluster out, other things being equal. At the close of a hot day you are likely to see a strong colony cluster out after working hard all day. Likely it is a good thing for them; there are more bees there than in the day when many were in the field, and it is too hot in the hive if all stay inside. As it cools off through the night the bees in the cluster will gradually enter the hive, especially if there comes a cold wave, and by morning all will be inside.

From what has been said you will easily see that ventilation has something to do in the case. The less the ventilation the more hanging out. During the hot weather you can hardly have too much ventilation. It is well to have the entrance open the full width of the hive, and anywhere up to 2 inches in depth. Also let the super be shoved forward or backward so as to make a ventilating space of a quarter to half an inch.

If the flow of nectar stops and the weather continues hot, a strong colony may hang out all day, and you can hardly blame them. It would be foolish for them to wear out their wings going to the fields when there is nothing for them, and it would be foolish to stay in the crowded hive when it is cooler outside.

The rain may have had a little to do with it, for during the rain the field bees would be kept home, making it more crowded and hotter.

If you want to keep queen-cells cut out, you don't need to go into the hives oftener than once in 8 or 10 days. But in too many cases the effect of cutting out cells is only temporary, and after a time a swarm may issue only a day or so after you have cut out all cells. It would be a long story to tell how to manage in such cases, but you will find it fully given in Dr. Miller's "Fifty Years Among the Bees."

Selling Comb Honey

Would you kindly tell me what you would think the best plan for selling comb honey?

Until last year I sold about all produced right at home by the pound, most of it in lots of from 10 pounds up to two cases to a customer, not graded as to weight. But last fall, having more than I could readily dispose of at home, and some nearby grocers wishing to buy it at the same price, sold several cases the same as taking 25c as a selling price per pound. In turn they sold it at an advance of 2 and 3 cents per section; one selling at 2c, the other at 3c. With cases of honey weighing all the way from 18 to 23 pounds per case, taking 25c as a selling price per pound an 18-pound case would retail, sold by the section, at the 3c advance, at $7.72, the same as a 23-pound case that brought $5.75. It does not seem a fair plan to either producer or consumer. If cases are graded as to weight in this State, does each section in a case have to be weighed and marked with the net weight ?

ILLINOIS.

The federal law obliging you to mark on each section a minimum weight does not apply in your case, as your honey is not shipped out of the State.

Since there is a good deal of difference in the weight of different sections of honey, the fairest way is to weigh each section and sell it by its weight. You may not want to go to that much trouble, but still you need not sell all sections at the same price. It is a comparatively easy thing to divide your sections into two classes by weight. You might, for instance, adopt 12 ounces as your standard. Set your scales at 12 ounces, and you can rapidly set one section after another on the scales. If the section pulls the scales down it belongs in the heavy-weight class; if it stays up it is a light-weight. You might divide still further by weighing again all your heavy-weights with the scales set at 13 or 13½ ounces. Then you could sell by the section, having the same price per section for all sections in the same class.

From what you say it sounds as if you sold to the grocer at the same price as you sold to the private customer. That is hardly fair to the grocer. He is entitled to his margin of profit to pay him for the trouble of handling the goods, and whatever the price at which he sells, you should not undersell him. If you cannot sell all your honey directly to the consumer, and find it advisable to sell part or all through grocers, then let them distinctly understand that in no case will you undersell them.

DR. MILLER'S ANSWERS

Send Questions either to the office of the American Bee Journal or direct to DR. C. C. MILLER, MARENGO, ILL. He does NOT answer bee-keeping questions by mail.

Queenless Robbers

Did you ever know of a stand of bees to rob, who were queenless? I found one of my stands overflowing with bees in March and went to them in April to get a frame of brood, and they had no brood at all, but were robbing another stand. I gave them fresh brood, but they simply hatched the brood and filled the cells with honey. They had a hive full of honey, mostly all unsealed; *no queen*, and no signs that they had had any since last fall; but lots of bees of all ages, but no drones, and not a cell of brood of any kind appeared. I gave the second frame of brood the last of April and on May 1 the hive had bees of all ages, inside the hive and out. They refused to start a queen-cell, although they were constantly running over the front of the hive, looking for their queen. I failed to find any signs of queen, and about the middle of May I divided them. They were in a hive three stories high, 8 frames to each story, making 24 frames in all, the whole year around, summer and winter. My bees are always heavy with fully 90 to 100 pounds for winter. I gave them each 4 frames of brood and now have 2 good, strong stands full of brood. It is my first experience with a queenless robber stand, and they were surely holding their own. They got two of my stands and I saw one of the stands move over

to them. They must have taken several from some other yard, as they were strong in bees all the time. C. B. PALMER.

ANSWER.—No, I never had a queenless colony that I knew to be robbing other colonies. But I have had queenless colonies—weak at that—that stored well for the number of bees. As a rule a colony that has been queenless for some time is weak and not very aggressive. In the present case the colony was strong and apparently eager to gather. If it found it could make a short cut by taking from another colony honey already stored, why should it not rob as well as a queenright colony? It was fiercely possessed with the desire to store, and this desire was so strong that it overpowered the desire to have a queen This last happens only too often. But queenless robbers are not common, and you may never see them again.

Room for Winter

1. Is there room enough in a ten-frame hive for a strong colony for winter if all supers are taken off?

2. At what latest time should supers be taken off to bring bees to the cellar?

WISCONSIN.

ANSWERS.—1. Yes, in winter there is plenty of room, even if more room would be better in summer.

2. Supers might be taken off a few days before the hives are cellared, or even the day before; but most prefer to take them off as soon as bees stop work on the fall flow.

Two Queens in One Hive

1. Will two queens winter safely in one hive with the old queen above an excluder and the young queen below?

2. Would they do better on separate stands?

3. Some people say bees can't build comb very late in the season; is it true?

FLORIDA.

ANSWERS.—1. They may, but one is likely to turn up missing before the winter is over.

2. Yes; yet if both are very weak they may both die separately, while they might live if separated only by an excluder, even if one queen should be lost.

3. They do very little comb-building late in the season, because comb-building is generally needed little then, but they *can* build comb whenever it is needed, no matter how late.

Fertile Eggs

1. I have a theory that a queen can't lay a fertilized egg unless the walls of the cell gently press the sides of the abdomen. This would account for a fertilized egg in a worker-cell and an unfertilized one in a drone-cell, but have not seen the theory advanced by anyone else. Am I correct?

2. When taking a frame of brood from another hive to be put in a hive when hiving a swarm, should one leave on the adhering bees, or brush them off?

PENNSYLVANIA.

ANSWERS.—1. This theory was held by some more than half a century ago. Others claimed it was the will of the queen that decided the matter. The latter said the former were wrong, because a queen would lay a worker-egg in a worker-cell barely begun. But in this case the cramped position of the queen in bending over might be just as effective as the smaller cell, and I have never seen any satisfactory proof that your theory is wrong.

2. I doubt if it makes any difference.

Improving Stock

I have built up my apiary so fast and devoted so much energy to number of colonies that I have very much neglected quality in stock. I have three colonies that are about all one could wish, good, light-colored goldens, even in color, as gentle as one could wish and apparently no faults; none of the three ever built cells or attempted to swarm.

Now a few questions:

1. Is there any common mistake or fault one is likely to make in breeding from the best queen?

2. Is there anything likely to develop in her daughter queens that it would not be advisable to rear a lot of her virgins and head her colonies with them?

3. Again, if I get a lot of her daughter queens reared and mated in my yard and they prove very satisfactory, then should I rear future queens out of those daughters of hers, or out of her own eggs, in case I still breed her?

In addition to answering these three questions, would you please criticize and comment on this plan of choosing a queen to breed from, and on the proper method of trying out and breeding up from her stock?

I have your book "40 Years Among the Bees," also Doolittle and Pellett's book on queen-rearing, and latest edition of Root's A, B C. LOUISIANA.

ANSWERS.—1. I do not think of any common fault you are likely to fall into unless it be in not becoming familiar enough with the literature you have upon queen-rearing. You have a splendid set of books upon that subject, and should read over and over what is said in them about queen-rearing. Too many own books without owning the ideas contained in them. I might also mention as a common mistake the practice of rearing cells with too small a force of bees. Up to the time a queen-cell is sealed it should always be in a *strong* colony. It is penny-wise and pound-foolish to have cells built in a nucleus, or even in a colony of medium strength.

2. I think not.

3. Better continue to breed from the old queen as long as she lives, unless one of her daughters proves better than the old queen.

In the Journal for July, page 244, the article "Selecting a Breeding Queen," should be of special interest to you. Please study it well. It will be followed later by the plan that is followed "in this locality" for deciding which queen to choose to breed from.

Queen Rearing

Will you give me your best plan for raising queens for my own use? State page in "50 Years Among the Bees," and if since the book was published you have found something better, please let me know what it is.

IOWA.

ANSWER.—In "Fifty Years Among the Bees" 1915 edition, if you will turn to page 218 and read the next 26 pages, you will get the best I know about rearing queens, and I have learned nothing better since.

But I imagine I hear you reply: "I don't want the labor of going through 26 pages; can't you tell me just where I can find on one page just what I need?" If you care enough about rearing good queens, I think it will pay you well to become familiar with those pages. Still, if you insist on getting in the smallest compass what will meet your case, turn to page 244. No; you needn't take that trouble. I'll copy it for you here: "Take from the colony having your best queen one of its frames, and put in the center of the hive a frame half filled, or entirely filled, with foundation. If small starters are used in a full colony the bees are likely to fill out with drone-comb. A week later take out this comb, and trim away the edge that hasn't any eggs. Put this prepared frame in the center of any strong colony after taking away its queen and one of its frames. Ten days later cut out the cells, to be used wherever desired, giving the colony its queen or some other queen."

Requeening

1. In "Fifty Years Among the Bees," talking of placing a nucleus with laying queen in the stand of a queenless colony, you say it never fails in your part of the country. From this I rather gather that there must be a catch somewhere, and would like to know if this will work; make my colony of blacks queenless, and 2 or 3 days later take that hive off its stand and place a queenright nucleus in its place. I would use the brood to form new nuclei, and would hope that the field force would accept the new queen.

2. Doubting that a colony was queenless, owing to a virgin queen not laying, and not to be found, a new queen (black) was introduced, because she happened to be on hand, just run in over the top bars and seemed accepted. There was a pile of her bees dead in front next day, and eggs shortly after that, but as the bees are of the Italian color, and the queen seems very yellow, would like to know if that pile of dead bees was proof that she was not accepted, though her body was not found, and that the queen originally given started to lay.

3. Having several colonies of black bees, and being determined to see the last of them this season, woud like to know if the following is practical and if the result would be good. I put a ten-frame hive with say 5 frames and a laying queen and a frame or two of brood on the stand of the blacks, and the original black colony alongside *without destroying* the queen, taking the old hive completely away in a few days?. I suggest this because I am a side-liner, and grudge the time and stings it takes to find black queens, whereas, if I can leave the whole field force with the new queen, the old one will be easier to find, and when found the whole old brood-chamber can go above to make an extracting super, for there should be no queen-cells started. ARGENTINA.

ANSWERS.—1. I should expect success generally. Something, however, would depend on the strength of the nucleus. The stronger the nucleus the greater the certainty of success.

2. If I understand correctly, an Italian virgin was introduced first, and afterward a laying black queen. The fact that bees and queen are yellow is proof enough that the laying black queen was put out of the way, even though accepted at the first, but I would hardly think the pile of dead bees proof in favor of one or the other, only that there had been two parties among the bees, one party adherents of one queen, and the other adherents of the other, and that there had been a battle between the two parties. In a good many cases where a queen was introduced I have noticed dead bees in front of the hive, indicating that a battle had occurred, although there had been only one queen in the case. Evidently some of the bees were hostile to the new queen, and her friends had massacred the insurgents.

3. There would probably be so few bees with the new queen as to make her situation rather critical. Let me suggest a modification of your plan. Remove the hive from its stand and in its place put a hive with a frame of brood. Set on top of this the old hive, with no communication between them. In a day or two all the field bees will be in the lower hive, giving you your chance to find the queen in the depleted hive above. This hive above will now be in fine condition to receive a new queen, since it will have mostly young bees. After the new queen has become established in her new quarters, perhaps in two or three days, take away the lower hive and set the upper hive down on the stand. The queen will have a strong force to protect her, and will be safe from attack by the entering fielders.

Foulbrood

1. Does foulbrood spread through a swarm that has some contaminated honey in it, or are the bacteria confined to the affected honey the bees have robbed?

2. Do bees bring honey from the hive-body to the supers above during honey-flow, and are bees apt to take honey from the supers above to feed the brood when they have plenty of honey below?

3. Is it sufficient to shake your bees directly from the diseased hive to the new, clean one?

WYOMING.

ANSWERS.—1. Yes, if there is a single con-

taminated cell of brood, it will spread throughout the hive.

2. They take honey from the brood-chamber, but in a flow they do not carry it down. When the flow is over they are likely to carry it down as fast as vacancies occur in the brood-chamber.

3. Yes; only you had better brush instead of shake.

Equipment

1. Are the protection or double-walled hives satisfactory, and what size frame is best?
2. How large a bee-space should a honey-board have, .163 inch perforations, or .172 inch?
3. What bees are the best?
4. Is bee-bread any good?
5. Are the aluminum honeycomb frames satisfactory? Would you advise me to get them altogether?
6. Are the wiring, nailing and wedge clamping devices advertised all right?
7. What is the best device for putting together sections, in starters, etc, at one handling. IOWA.

ANSWERS.—1. Opinions differ, and localities differ. Most Iowa beekeepers prefer single-walled hives wintered in cellar.

2. Likely .163 is better.

3. Three-banded Italians are generally preferred.

4. It is often of more value than honey. No young bees can be reared without it.

5. They are as yet new, and largely untried.

6. Likely they are, although all may not be of equal value. I must confess ignorance, in that I have not tried all of them.

7. I don't know. Some think it better to have two machines, one to put the sections together and one to put in the foundation.

Foulbrood

In treating foulbrood nearly all writers say to put the bees on foundation starters until they have cleaned themselve of infected honey and wax and then give them full sheets to begin over with. Please tell me why it would not do as well to cut out all brood and honey from infected frames of combs, just leaving enough dry comb at the top to show them where to start, instead of furnishing new frames with starters to be destroyed as soon as used? KENTUCKY.

ANSWER.—Instead of brushing twice, as you mention, isn't it the general practice nowadays to do the one brushing upon full sheets? One objection to your plan is that it would be inconvenient. You would hardly want to cut out combs in less than three weeks after treatment, for you want the brood to hatch out. Also, to leave a margin of dry comb would be just what you don't want, for you don't want the bees to have a place to deposit the infected honey, but you want them to use it up before there is brood to be fed.

Extracting—Bees Loafing

1. I am just a beginner in this busy bee business and would like to know how honey is extracted, where only one or two stands of bees are kept and no extractor in the neighborhood.

2. I have a 10-frame hive with super in a well-shaded place and for three weeks or more a large number of bees cluster on the outside of the hive, and sometimes hang in bunches the size of a baseball under hive-stand in the hottest part of the day. Sweet clover is in full bloom and the worker bees seem to be just as busy when this occurs as at any other time, but have difficulty in entering hive with so many bees crowding the entrance. UTAH.

ANSWERS.—1. Without an extractor there is no way to get the honey and save the comb. You can crush the comb and strain out the honey through a cloth, or you can melt the combs, let cool, and then take the cake of wax off the top, but neither of these ways is very satisfactory.

2. It is nothing very unusual for bees to hang out in this way, and when it occurs at a time when there is plenty of bee-forage in the fields, it is generally due to the heat and too little ventilation. Give plenty of shade and ventilation; you can hardly overdo the matter. (Possibly they need more super room.—Ed.)

Wintering Equipment, Etc.

1. Which is the best way to winter bees, indoors or outdoors?
2. Is Michigan a good state for beekeeping, and which part is the best?
3. Which is the best packing when you winter bees outdoors?
4. Does it pay better to feed bees honey, or syrup, in spring?
5. How do the Dadants winter their bees?
6. What is the average of pounds in Texas of honey secured as a surplus? in Michigan?
7. Should bees have shade or not?
8. Where can one secure a 20-frame hive?
9. One of the most successful beekeepers of the United States told me that Texas was the best State for beekeeping; do you agree? I think the temperature is unbearable down there, and unhealthy, so I would not like it much there.
10. Is the Dadant hive a better hive than the Langstroth, and how many frames has it? ILLINOIS.

ANSWERS.—1. North of parallel 40 or 41 bees are generally cellared, although some prefer outdoor wintering; south of that they are wintered outside.

2. Michigan is good, especially north, where fireweed and wild raspberry abound.

3. It is largely a question of what is convenient for you. Chaff is good, also leaves, and planer shavings.

4. Honey; it contains elements necessary for the welfare of bees that are not at all found in sugar.

5. Outdoors.

6. I don't know.

7. Better in general to have shade.

8. I suppose they can be made to order at any hive factory.

9. For those who live there and like Texas best, it is probably the best State. Like enough Illinois is better for you.

10. The Dadants and others who use it like the Dadant better, and like enough some others who do not use it would also like it better if they should try it.

Shaking

1. In the American Bee Journal for April, 1917, page 135, in answer to "Pennsylvania," paragraph 3, you say: "However, it will be all right if you leave at least one frame without shaking, provided it contains one or more good cells." Do you mean by that that the bees will rear a good queen if they are not shaken, which I never do, until the cells they have started are well advanced or nearly ready to seal, or would it be better to take away the queen and two frames of brood as advised? I want to raise the best queens possible, but have a hard time finding the queen, and want to avoid that trouble if possible. How would it do to leave three or four frames unshaken, including the one with the cells, set the hives close together at the old location and within a week shake or brush again and put the hive with the sealed cells on a new stand?

2. The first lot of honey I took off the hives this year has, when the combs are held in front of a strong light, a deep orange or reddish color, and the honey seems to be rather thin, and to me it hasn't the flavor of other years, although people to whom I have given some thought it was good. I have not, however, so far noticed any peculiar smell about it. Do you think there is honeydew mixed with it? If there is, is it fit to eat? Would it be all right to feed to the bees next spring, if they need it? Other years my honey was always of a very pale yellow color when held to the light, and people here and at Philadelphia always told me that it was of extra fine flavor. The honey that is ready to take off now looks much better. PENNSYLVANIA.

ANSWERS.—1. In the sentence quoted the point made was that it would not do to shake queen-cells, as that would spoil them, but to avoid shaking, the bees must be brushed from the combs, or at least one frame containing one or more cells should be brushed and not shaken. So I hardly meant just what you say. Still it is true that if you wait till the cells be about ready to seal, and then brush (not shake) you ought to secure good queens. The only object of removing the queen in the instructions given was to get cells started, and if the cells are already started there is no need to remove the queen. If I understand your present proposal, it is to divide the colony into two hives, cells being in each hive, and then a week later move to a new stand the queenless hive, leaving on the old stand the queen and most of the bees, and on the new stand all or nearly all the brood with bees enough to protect the brood, no cells being left with the queen. That will be all right, only that in some cases there might be danger of the queen swarming before the second taking of brood from her.

2. It looks as if the specially colored honey was from some particular plant rather than from a mixture of honeydew. However, even if there is honeydew in it, it will be all right for the table for anyone who likes it, and it will be all right to feed next spring, although honeydew is not good for winter stores.

Division—Packing

1. Our bee forage through the season is first the willows, soft maples, fruit bloom, alfalfa, yellow and white sweet clover, basswood, sumac, heartsease or smartweed, besides other flowers. Now I want to divide my colonies. Frost comes about the 10th or 15th of September, here in Nebraska. Would it not be better to divide about the 10th or 15th of August.

2. Now, about packing for winter. I intend to leave them on their stands. I thought of taking tar paper and wrapping it around the hives, driving a stake at each corner, to leave a space of about 4 or 5 inches and packing with dry leaves or fine straw, putting a super on top with leaves in it with cover on top and bring the paper up to the cover and tacking it to keep the water out.

3. Would it do any harm to give them all the sugar syrup they will take?

4. Would you winter them in 2 hives or just brood-nest, with a packed super on top? NEBRASKA.

ANSWERS.—1. That is likely to work well if you save up frames of sealed honey from that gathered earlier, so as to give to any colonies that do not gather enough after the division.

2. That ought to work.

3. You are not likely to have the brood-chamber too full of stores unless it be so full next spring that the queen hasn't room to lay in; only remember that sugar is not as good as good honey. (It is better winter feed for bees outside.—F. C. P.)

4. If you mean two stories without the packed super on top, I should prefer the one-story with packed super; but would a little rather have the two stories with packed super.

Metal Covers—Honey Plants

1. Which would you prefer, a wood or metal cover for a hive? Would not the metal cover have a tendency to heat and smother the bees and melt the honey more than the wood if hive is exposed to sun?

2. Could not alfalfa be used for hay and at the same time for a honey plant?

3. Describe buckwheat as a honey-plant; time it should be sowed, etc. MISSOURI.

ANSWERS.—1. Metal; that is, a wooden cover covered with zinc or tin. I have such covers that have an air space between two layers of thin boards, and I think there is less trouble from the heat with them than with covers all wood.

2. I don't know that there's any place where at least part of the alfalfa is not used for hay. But there will generally be some

bloom before it is cut for hay, and some will be allowed to bloom for seed.

3. Buckwheat is one of the best honey-plants, yielding one of the darkest honies, liked more than the lighter honies by some, and disliked by others. In some places it fails to yield in some years, and in all places generally yields nothing in the afternoon. For full information see the books, or send to U. S. Department of Agriculture, Washington, D. C., for bulletin on buckwheat. (Buckwheat yields but little honey in Missouri.—F. C. P.)

Behavior of Queen

IN long and continued observations of colonies in observation hives. I have repeatedly observed an action on the part of the queen which I am beginning to believe may cause swarming at times when it is not easily explained. You know bees sometimes swarm out and leave brood behind, shortly after hiving, or at times swarm with queen-cells only started. This has always been puzzling.

Observation of a queen here in a weak one-frame nucleus shows her repeatedly searching for empty cells, which in her case, are only found **outside** her small cluster. She wanders off, usually alone, poking her head into these cells, but **not** laying. Frequently I have seen her go too near the entrance. In doing so she flutters her wings, probably making some sound which I cannot hear, but which **immediately arouses the entire cluster so that many of them rush toward her.** Once I saw some of the bees **rush outside the entrance** while others headed her off and actually seemed to push her back, with their antennae, toward the cluster.

Might not such wanderings on the part of a queen be the cause of some of our inexplicable swarming under abnormal conditions? I believe it is, when she wanders too close to the entrance and may be seized with a desire to try a flight. Anyway, I give you the observation for what it may be worth.

KENNITH HAWKINS.

St. Louis Beemen Organize

St. Louis, Mo., May 23.—A group of local beekeepers recently met and formed what will probably be known as the Mound City Bee Club. The purposes of the organization will be:

To learn to keep bees better.

To co-operate with inspectors in preventing and curing disease, and to protect, if possible, members from purchasing bees which are known to be affected.

To diplomatically discourage "nail keg" beekeeping as a menace to the industry.

To join with other honey producers of the State in a united effort to bring about more beneficial legislation at Jefferson City.

To secure expert instruction at meetings, and, if possible, representation at conventions.

To pool their wits and efforts in solving problems which could not easily be overcome individually.

To collectively stimulate honey consumption by the distribution of proper literature and judicious advertising.

To endeavor to standardize packages—at least locally.

To learn to calculate production costs.

To collectively purchase supplies.

And last, but not least, to enable the enthusiasts to meet and "get it out of their system,' 'and be thereby no longer a bore to their long-suffering friends who don't care a rap about bees.

All interested local apiarists who would like to help swell the crowd at the next meeting are invited to communicate with the undersigned.

A. G. VAN RONZELEN,
223 Dover St.

Honey Granulation—Bees in Pound

Replying to enquiry of "Ontario," page 254, June issue, relative to granulation of honey; here my experience and observation show that the more thoroughly the honey is ripened (regardless of the source) the finer the grain and more compact the texture, even to almost the smoothness of the choicest and purest of lard.

In reply to your comments, page 206, same issue, relative to the number of bees contained in a pound and the amount of nectar, by weight, that they carry, will say, the whole situation is guesswork, and my estimate was based upon actual weight of empty bees and bees loaded during a good honey flow, and not the half-way situation in either instance, and to my mind the only way to know positively and accurately would be to weigh at least one-fourth pound of bees that had actually starved and another one-fourth pound of those known to be loaded, honey-sacs full of nectar, and when this is done you will find that my estimate is the more nearly correct. ELIAS FOX.

Increased Appropriations

Several States have appropriated liberal sums for beekeeping work at the recent sessions of the legislature. Among the latest reports is that from the State of Connecticut, where the money available for bee inspection has been increased from $1,500 to $4,000. A law also was enacted requiring all beekeepers to register with the town clerk. If the provisions of this law are generally complied with it will enable inspectors to locate all the bees in the territory where they are at work.

Don't Like the Italians

I would like to see a discussion of the different breeds of bees. I think that the Carniolans and Caucasians are the best honey gatherers. I have no use for the Italians. They may be all right for extracted honey.

WINSOR W. LANTIS,
Perry, Mich.

(The above letter is a reminder that the Italians have had far more publicity than other races. Let us hear from the beekeepers who have given other races a fair trial.—Ed.)

NEWS DISPATCHES

Bees Sting Horses

Vincennes, Ind.—A swarm of bees which settled under a team hitched to a disc on the John Wampler farm frightened the horses and caused them to run away. The farm-hand on the disc was thrown off and dragged a considerable distance. One of the horses struck its leg against one of the sharp discs, severing it. The animal was killed.—Indianapolis Times.

Stray Swarms Hived By Firemen

Yakima, Wash.—A recent newspaper report of the capture by Yakima firemen of a swarm of bees in a tree near the fire station has been followed by a number of telephone calls from all parts of the city asking the firemen to "come and get a swarm of bees just outside my house." As a result, the firemen have collected an apiary of nine stray swarms, which are hived near the fire station and apparently are contented and thriving.—Seattle Post Intelligencer.

Bees Used in Battle

Probably the most remarkable weapons of war ever used were swarms of bees. There are at least two well-authenticated instances of the use of this novel and stinging war material.

The first is related by Appian, of the siege of Themiseyra, in Pontius, by Lucullus, in his war against Mithridates. Turrets were brought up, mounds were built and huge mines were made by the Romans. The people of Themiseyra dug open these mines from above, and through the holes cast down upon the workmen bears and other wild animals, together with swarms of bees.

The second instance occurred in Enilant. The Danes and Norwegians were attacking Chester, held by the Saxons and some Gallic auxiliaries. After adopting stoning and boiling water in vain against the besiegers, the Saxons threw down all the beehives in the town upon the attackers, who were soon routed.—Toronto Evening Telegram.

Spacing of Combs, Etc.

Would you advise the pacing of combs 1½ inches from center to center? With this additional space wouldn't the bees elongate the cells in the extracting supers? I find with the above spacing a 10-frame hive would require about nine combs. Would nine combs be all right in the brood-chamber when the bees go into winter quarters?

I examined a 2-story hive a few days ago and found a laying queen above and below. How did that queen get into the upper story, with a wood and zinc queen-excluder between the two bodies?

I put the upper story underneath a queenless colony with one thickness of newspaper between them. Should I have used more than one thickness of paper?

Illinois.

You will do well to space 1½ inches. Nine frames in a ten-frame brood-chamber will allow good wintering, and those successful beekeepers, the Dadants, attribute their almost total immunity to swarming mainly to the fact that they have large hives and also wide spacing. In a brood-comb filled with sealed worker-brood, the combs will be of the same thickness, whether they be spaced 1⅜ or 1½. The thickness of such a sealed comb is not far from an inch, leaving a space of about ⅜ inch between two combs where the combs are spaced 1⅜. With 1½ inch spacing the space between two combs is about half an inch. So with the larger spacing there is more room between combs than with the smaller spacing, and this makes the bees less crowded, and it is easy to believe that they will be cooler and less inclined to swarm.

As to wintering, the probability is that there would be no trouble if combs were spaced anywhere up to 2 inches apart. In our cellar in winter it is a pleasant sight to see bees of a strong colony clustered below bottom-bars and filling entirely the 2-inch space between bottom-bars and bottom-board. If a 2-inch cluster is all right under the frames, why not between them, thus making them spaced 3 inches apart from center to center?

One way to account for a queen above the excluder, beside the one below, would be to say that a queen was reared in the upper story, either because brood had been above or because bees carried an egg above.

One thickness of newspaper is enough to use when uniting bees in two different stories.

Bees and Fruit

Spokane, Wash., July 10.—An interesting clash of interests appears to have developed in the fruit-producing district, of which Spokane is the commercial center, as between fruit growers and apiarists.

One side of the subject is set forth in a statement by E. B. Kelly, State Agricultural Inspector, who says: "Never before has the Inland Empire apple crop showed up the need of bees in this district as it has this year. Many apples will be lost this year because of lack of proper pollenization, and although the loss does not compare with the frost damage, it is very noticeable. There are a few bees in the Inland Empire, but the majority of fruit growers depend too much upon their neighbors' bees for charity work and sooner or later the live producer will see the need of having a good stock of bees on his own farm.

"If bees are introduced into the Inland Empire on a large scale, the farmers will first have to provide better means of feeding. Food secured by the bees during the fruit season will not be enough for their winter supply and every corner and nook will have to be sown in clover."

Quite another aspect is presented in a dispatch from Prosser, Wash., as follows: "Startling mortality among bees indicates an unusual shortage of honey in the Yakima Valley for the present season. Tons of honey were shipped from this locality last year and brought fancy prices. W. H. Tucker, who had over 200 stands of bees, which yielded him an income from $25 to $54 a stand last year, reports that he will have no honey for sale this year.

"He states that the unusual value of the apple crop has caused orchardists to continue spraying much later than heretofore and in much heavier quantity. The chemicals in the spray fluids is killing the bees by the million. Mr. Tucker started this season with 250 stands, 50 of which have been entirely wiped out, and no more than 10 to 20 per cent of the inmates of the remaining stands still survive."

The subject will be debated at fruit growers' conventions this fall. There seems to be a strong conflict of opinion as to whether the spray used to combat coddling moth is fatal to bees.

Louisiana Meeting

J. F. Archdekin, Big Bend, was named President of the Louisiana State Beekeepers' Association at Baton Rouge, Friday, August 8, when the first meeting of the kind ever held in the State was called as part of the Tenth Farmers' Short Course. E. C. Davis, Federal Extension Agent for Louisiana, who was named Secretary, was instrumental in the calling of the meeting. Other officers are: Geo. H. Sexton, Atchafalaya, Vice President; R. L. McCoy, New Roads, Second Vice President, and F. M. Morgan, Hamburg, Treasurer. Thirty-seven charter members joined, and Mr. Davis expects the list to swell to 100 before January 1. Talks at the meeting were given by J. F. Archdekin, F. M. Morgan, Geo. Sexton, C. J. Free, R. L. McCoy and Rev. G. P. White. Louisiana is not overcrowded in beekeeping, and this new organization presages a great future development. K. H.

CLASSIFIED DEPARTMENT.

Advertisements in this department will be inserted at 15 cents per line, with no discounts of any kind. Notices here cannot be less than two lines. If wanted in this department, you must say so when ordering.

BEES AND QUEENS

FOR SALE—Golden Italian queens, untested 85c, two $1.50.
J. F. Michael, Winchester, Ind.

QUEENS AND BEES—This fall is proper time to replace all queens 2 years old, as well as the failing ones. Circular free. See large add elsewhere.
Nueces County Apiaries,
E. B. Ault, Prop., Calallen, Texas.

FOR SALE—Italian queens, from best disease-resisting stock, mailed as soon as hatched. Directions for introducing with every order. Price, April to October, in large or small lots, 60c each. James McKee, Riverside, Calif.

FOR SALE—100 colonies of bees, mostly Italians. In 10-frame dovetailed hives, wired frames; no disease. Also 100 supers. Bees in fine condition.
Garrett H. Creech, Central City, Neb.

FOR SALE—Fine Italian queen bees (free from disease), each $1, $10 per doz
Jul. Buegeler, New Ulm, Texas.

FOR SALE—Tested 3-banded Italian queens, $2; safe arrival and satisfaction guaranteed.
Clinton Bradway, Monson, Mass.

I SHALL have 10 or 12 colonies of bees for sale as soon as honey gathering is over. These are in 10-frame hives with Hoffman wired frames, filled with full sheets Dadant's foundation. Other particulars and prices on application. Edwin Bevins, Leon. Iowa.

REQUEEN—Three-banded Italian queens for fall requeening now ready. Untested, $1 each; select untested, $1.25. Safe arrival and satisfaction guaranteed.
H. A. McCarley, Mathis, Tex.

FOR SALE—Leather colored Italian queens, tested, June 1, $1.50; untested, $1.25; $13 a dozen. A. W. Yates,
15 Chapman St., Hartford, Conn.

ITALIAN QUEENS—Northern bred, three-banded, highest grade, select, untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness and perfect markings. Price $1 each.
J. H. Haughey, Berrien Springs, Mich.

THREE-BANDED ITALIANS ONLY — Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. H. G. Dunn,
The Willows, San Jose, Calif.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you desire. They are great honey gatherers, beautiful and gentle. Virgin, $1; mated, $2. C. W. Phelps & Son,
8 Wilcox St., Binghamton, N. Y.

GOLDENS that are true to name. Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. Garden City Apiaries,
San Jose, Calif.

FOR SALE—3-band Italian queens ready June 1. Untested, each $1; twelve, $10; 100, $80. No disease here and satisfaction guaranteed. A. E. Crandall & Son,
Berlin, Conn.

LEATHER and all dark colored Italian queens, when we have them, mated, $1 each. These queens will include all that are not up to the standard in our goldens, but will be good utility stock. C. W Phelps & Son,
No. 3 Wilcox St. Binghamton, N. Y.

FOR SALE—Pure 3-banded Italian queens, as good as you can buy with money, from June 1 to September 1.
J. F. Diemer, Liberty, Mo.

BEES AND QUEENS from my New Jersey apiary. J. H. M. Cook,
1Atf 84 Cortland St., New York City.

SWARTS GOLDEN QUEENS produce golden bees of the highest quality; satisfaction guaranteed. Mated, $1, 6 for $5; tested, $2.
D L Swarts, Lancaster, O., Rt. 3.

FOR SALE—Hardy Italian queens, 1, $1; 10, $8. W. G. Lauver, Middletown, Pa., R. 3.

FOR SALE—Three-banded Italian queens; untested queen $1, six, $5.50; twelve, $10. Tested queens $2 each.
Robert B. Spicer, Wharton, N. J.

EDSON APIARIES increased queen rearing facilities will insure the prompt delivery of A1 laying Italian queens, leather colored or golden. Prices reasonable Address
Edson Apiaries, West Butte, Cal.

FOR SALE—Golden queens second to none, for honey gathering and gentleness are unsurpassed; untested $2, tested $5 to $10.
E. V. Marston, Roxbury, Va.

FOR SALE—J. B Brockwell's golden queens, untested $12 per doz., $7 for 6, $1.50 each; 3-frame nuclei $8, with queen. Tested queens $3 each. J. B. Brockwell, Barnetts, Va.

QUEENS, QUEENS—We are now up with orders; are mailing queens day after receipt of rush orders. No disease; satisfaction guaranteed. Best Italian untested queens 1 for $1, 12 for $11.50, 50 or more 90c each. I will care for your interests.
W. E. Achord, Pike Road, Ala.

FOR SALE—20 colonies bees, mostly Italians. A. C. Gould, Weston, West Va., Route 4.

WARRANTED QUEENS—Dr. Miller's strain. $1 each, $10 per doz.; tested $1.50 each, $15 per doz. Safe arrival and satisfaction guaranteed. Geo. A. Hummer & Sons.,
Prairie Point, Miss.

"SHE SUITS ME" Italian queens, $1.15 each, from May 15 to October 15; 10 or more, $1 each. Allen Latham, Norwichtown, Conn.

FOR SALE—One hundred stands of bees in 8 and 10-frame hives, wired frames; bees healthy. Write for prices and particulars.
Duane Shaw, Palestine, Ill.

WANTED—Second-hand honey extractor; state make, condition and price.
J. Stevenson, Richmond S. I., N. Y.

FOR SALE—Baby swarms, three frames and queen, $5. J. A. Dougherty,
Box 66, California, Hamilton Co., Ohio.

FOR SALE—Italian bees and queens (the kind that fill from 2 to 6 supers). Bees, $12 a colony; queens, $2 each, 6 for $11. Queens go by mail, bees by express. Order direct from this ad. Miss Lulu Goodwin,
Mankato, Minn.

FINEST THREE-BANDED Italian queens for $1.25, 6 for $7. J. W. Romberg, Apiarist,
3113 Locust St., St. Joseph, Mo.

HONEY AND BEESWAX

WE BUY HONEY AND BEESWAX—Give us your best price delivered New York. On comb honey state quantity, quality, size, weight per section and sections to a case. Extracted honey, quantity, quality, how packed, and send samples. Chas. Israel Bros. Co.,
486 Canal St., New York, N. Y.

FOR SALE—New clover honey in new 60-lb. cans, 2 cans to case; also buckwheat honey in kegs and cans. Write for prices; sample 15c.
E. L. Lane, Trumansburg, N. Y.

FOR SALE—5,000 pounds clover extracted honey, new crop, two 60-lb. cans to case, 25c per pound. J. P. Goodwin,
South Sioux City, Neb.

FOR SALE—Clover extracted honey of finest quality, in new 60-lb. cans, two to the case, at $24 a case. Order from this ad.
Martin Carsmoe, Ruthven, Iowa

HONEY—Pure extracted clover and basswood, choicest quality; one 60-lb can, $13.50, two cans in case $26. Sample 10c.
The Riverview Apiary,
Ed. B. Klimaschesky, Mahnomen, Minn.

WANTED—Clover honey, comb and extracted. Buckwheat considered if price is right. State lowest cash price at your station. Sample will be requested if price suits.
The Forest Honey Co.,
2323 S. Woodstock St., Philadelphia, Pa.

FOR SALE—6,000 lbs. of honey, mesquite blend; well cured, in new 60-lb. cans; two cans to case. Subject to best cash offer, F. O. B. here.
Chas. Heim & Sons, Three Rivers, Tex.

WANTED—Honey, in light and amber grades. Send sample, stating quantity, how put up, and lowest cash price delivered in Spring Valley. Ed. Swenson, Spring Valley, Minn.

FOR SALE—15,000 pounds of fine clover and basswood honey. The best offer takes it if satisfactory. Chester E. Keister, Clarno, Wis.

FOR SALE—New crop clover extracted honey, two 60-pound cans to case, 25c per pound.
H. G. Quirin, Bellevue, Ohio.

WANTED—Comb, extracted honey and beeswax. R. A. Burnett & Co.,
6A12t 173 S. Water St. Chicago, Ill.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co.,
204 Walnut St., Cincinnati, Ohio.

WANTED—Extracted honey, all kinds and grades, for export purposes. Any quantity. Please send samples and quotations.
M. Betancourt, 59 Pearl St., New York City.

FOR SALE

FOR SALE—My 5-acre piece of land, with modern 8-room house, good barn, chicken coop, bee house and woodshed; all in good condition. Reason for selling, going on a farm. Address Theo. L. Thompson,
Spring Valley, Wis., Rt. 4, Box 7a.

FOR SALE—Blue vine seed, or climbing milkweed (*Genolubus Laevis*), 6 pods containing innumerable seed mailed to any address upon receipt of $1.
S. H. Burton, Washington, Ind.

FOR SALE—Or Trade for Honey—Used 5-gal. cans, bright; case of 2, $1; not so sightly, but bright inside, case of two, 80c; no leakers. E. H. Bruner,
3836 N. Kostner Ave., Chicago, Ill.

FOR SALE—Or will exchange for bees—One 240-egg Old Trusty Incubator, in fine shape, price $20 One 38-55 Winchester rifle, in good shape, $12. Jas. D. Webb, Hazelhurst, Wis.

BLACK SIBERIAN HARE—World's greatest rabbit for fur and meat. Write for information.
Siberian Fur Farm, Hamilton, Canada.

FOR SALE—Clover and buckwheat honey in any style container (glass or tin). Let us quote you. The Deroy Taylor Co.,
Newark, N. Y.

FOR SALE—Cedar or pine dove-tailed hives; also full line of supplies, including Dadant's foundation. Write for catalog.
A. E. Burdick, Sunnyside, Wash

FOR SALE—Photo of L. L. Langstroth, inventor of movable-frame hives, size 7x9; price, $1. American Bee Journal,
Hamilton, Ill.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
Superior Honey Co., Ogden, Utah.

FOR SALE—8 acres land, 300 colonies bees; land in high state of cultivation, growing second crop now; price per acre, $200. Apiary in three yards; production highest average in 10 years, 96 lbs. extracted honey, lowest 23 lbs, per colony, S. Mason, Hatch, N. M.

FOR SALE OR TRADE—Model 10 Royal standard typewriter, visible; like new; cash $50. Cost $100. E. A. Harris, Albany, Ala.

FOR SALE—$4,800, 183 acres two miles from Pleasant Lake, N. Dak.; 100 acres of it in wheat. The crop goes with the farm, if sold promptly. Near the main line of the G. N. R. R. Address,
"R," American Bee Journal Office,
Hamilton, Ill.

WANTED

WANTED—Your old combs, cappings or slumgum to render into beeswax by our high steam pressure wax presses.
Dadant & Sons, Hamilton, Ill.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices.
Superior Honey Co., Ogden, Utah.

WANTED—I have a fine location in California and want a man to associate himself with me in the beekeeping business. I have the stock of bees and equipment here in Arizona; wish to ship all to a certain point in California this fall; have an attractive proposition to offer the right man that can invest in half interest in what I have. Tell your story in first letter.
J. B. Douglas, Box 1085, Tucson, Ariz.

SUPPLIES

FOR SALE—Good second-hand empty 60-lb. honey cans, two cans to the case, at 60c per case, f. o. b. Cincinnati; terms cash with order. C. H. W. Weber & Co.,
2146 Central Ave., Cincinnati, O.

MY FEEDER—Make 'em yourself. I tell you how. Won't rust. Sample and tool postpaid, 24c. Dr. Bonney, Buck Grove, Ia.

FOR SALE—Beehives and supers. Address
Thos. Cordner, Rt. 7, Sparta, Wis.

SPECIAL—Best No. 1 Sections, per crate of 500, $3.50; other goods in proportion. Price list free. H. S. Duby & Son. St. Anne, Ill.

MISCELLANEOUS

E. D. TOWNSEND & SONS, Northstar, Mich., offer their 1919 crop of white clover and white clover and basswood blend of extracted honey for sale. This crop (it's only a half crop this year) was stored in nice, white, clean extracting combs that had never had a particle of brood hatched from. We had more of those extracting combs than we could possibly use this year and we piled them on the swarms as needed and *not a single ounce of honey was extracted until some time after the close of the white honey flow*, consequently *none* could be produced that will excel this crop of honey. Of course, it is put up in new 60-lb. net tins and they are cased up for shipment, two in a case. If you are one of those who buy "just ordinary" honey, at the lowest price possible, kindly do not write us about this lot of honey, but if you can, and have customers who will want the very best and are willing to pay the price, order a small shipment of this fine honey as a sample, then you will know just what our honey is, and whether it is worth the little extra price we ask for it or not. We quote you this fine honey, either clear clover or that containing about 5 per cent of basswood, just enough basswood to give it that exquisite flavor relished by so many, at only 25c per lb. on car here at Northstar. Kindly address with remittance, E. D. Townsend & Sons,
Northstar, Mich.

Don't stop advertising.
because honey is high. Make it more in demand, so the price will stay where it is. Little stickers on your letters, papers, etc., will help. Printed as below in bright red.

Price of 1,000 gummed, 35c.
American Bee Journal Hamilton, Illinois

ATTRACTIVE CLOTHES

Do not make the man, but they add greatly to his appearance.
Just so with your honey. It must have quality, but should have a neat package and an attractive label.
We can furnish the label. In many sizes and shapes suitable to fit any container.
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American Bee Journal, Hamilton, Ills.

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The Colorado Honey-Producers' Association
1424 Market Street, Denver, Colo.

Crop and Market Report

Compiled by M. G. Dadant

For our September report we asked the following questions of our reporters:

1. What has the yield been?
2. What do you expect in the fall flow?
3. How is honey selling, and what is being offered for the same?
4. Is there tendency to go back to comb honey, owing to the demand for it?
5. Give information on prices and future prospects.

THE CROP

It is unfortunate that the crop has been as short as our reports would indicate. We would judge that the total crop will fall considerably short of last year, this owing to the fact that there will be a falling off in many of the larger producing areas, as in the inter-mountain States and in California.

The New England States report the crop as only fair, but not near up to last year. Nor is New York up to the average. Prospects are yet favorable, but it is doubtful if the total crop will come up to last season.

In the South, conditions are about up to last year, with some localities reporting less and some more. Kentucky has about two-thirds of a crop, while Alabama is above average. Louisiana is poor, as is Arkansas.

In Texas the crop has about come up to expectations and is generally much better than last year, some claiming 200 per cent more than in 1918. The flow has been interfered with to some extent by excessive rains. The mesquite flow has suffered in this manner. But the crop the State over is very good, and beekeepers are much encouraged. They are beginning now to recoup their losses.

The whole white clover area will have scarcely any crop, though there are spots, such as Wisconsin and western Iowa, where the crop will be good. Illinois will have no clover honey to speak of, nor will the bulk of the white clover producing area.

Michigan will have less than a half crop, while Wisconsin may have more.

Reports vary from the inter-mountain territory, but indications are that the crop will not bulk up to what it was in 1918. Colorado is fair, with Montana, Utah, Wyoming and some other States much below what they expected.

In California all of the reports, with the exception of probably one, indicate that the crop is not much over half of what it was in 1918, and that it cannot be over 60 per cent of normal. Drought has cut in on the bean crop, and indications for future crops are not of the best.

All in all our guess is that the crop for the whole country will not be much over 75 per cent of what it was last season.

FALL CROP

Very few localities report fall crop prospects, and their bearing on the total is so small as to be neglected. In the Central States, those located near the Spanish needle and other fall flower fields, are hoping that their bees can at least pick up enough to put them in good condition for winter.

HONEY SALES, ETC.

Honey is probably selling as readily as it ever has at this season of the year, except when the sugar restrictions were in effect. In fact, the shortage of sugar recently and the high prices of fruits to can has probably increased the demand over normal.

Most of the honey moving as yet, in the hands of dealers, is of last year's crop, which in many instances is being sold at a loss so as to clean up the old honey and get ready for the new crop coming in.

EXTRACTED TO COMB

Very few are thinking of changing back to comb honey, although there is a possible tendency that way. The price of extracted has remained so high, and comb honey prices so low in comparison, that the change back has not been tempting. It may be that the shortage of comb honey will assert itself later on and that its price will advance so as to be an extra inducement for next season.

PROSPECTS FOR HONEY PRICES

In most instances producers are being offered from 14 to 16 cents for amber honey and from 16 to 18 cents for white, with many sales at these prices. We understand that one of the biggest bottlers of honey is offering and has bought some white honey at a price of 18 cents. Buyers, as a rule, do not seem anxious to offer, and this is not to be wondered at, since most of the big wholesalers and bottlers have stocks on hand from last year which they would be glad to clean up at last year's prices. In fact some of them are selling at a loss. We got one report of 1,200 cases bought at 26 cents last fall being sold for 12 cents this summer. We hardly believe that the loss has been this great in most instances, but we do know of one or two instances in which 25-cent honey has gone begging when offered at 20 cents. Naturally this is going to hold back many advance offers on honey on the part of the fellow who is still holding over some of his 1918 purchases.

We do not believe, however, that the beekeeper need be fearing a slump in the honey prices. This honey will gradually clean up, and we hope that the market will stiffen as fall approaches.

Surprising as it may seem, practically all producers are holding for better prices than are being offered. Nearly all reporters we are in touch with desire prices of at least 18 cents for amber and 20 cents for white honey, and many of them state that they must have last year's prices, approaching 25 cents, before they will sell.

Of course, the market is still bound to be unsettled, but it hardly seems possible that honey prices will hold to where they were a year ago, when the sugar embargo was in effect, the war on, and the price inflated, so to speak. We do believe, however, that a price approaching 20 cents for white honey should obtain, and the shortage of sugar should have not a little to do in getting it, and even in pushing it to a higher point. Such prices should be sufficiently remunerative to the commercial beekeeper.

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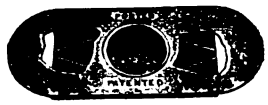

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AMERICAN BEE JOURNAL

VOL. LIX—NO. 10 HAMILTON, ILL., OCTOBER, 1919 MONTHLY, $1.00 A YEAR

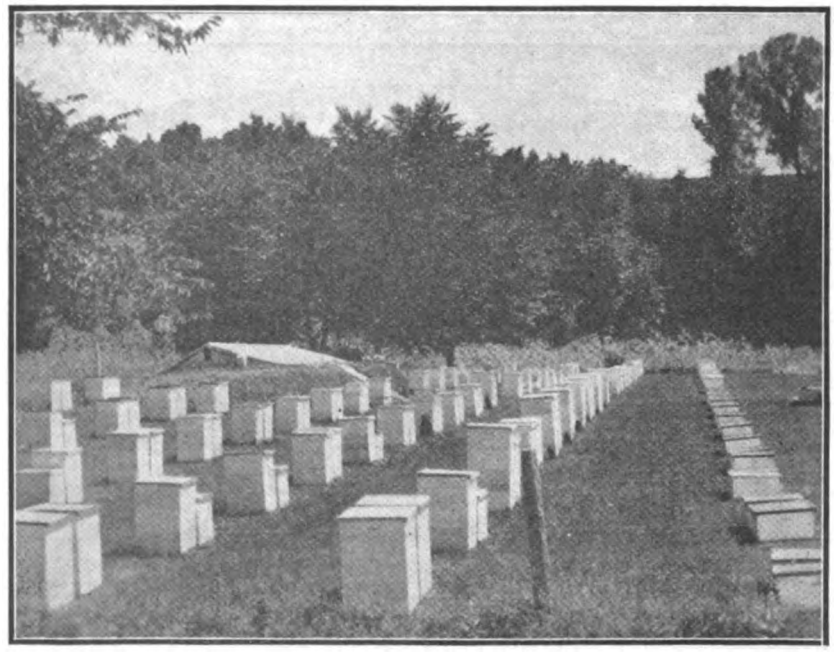
BEEKEEPING IN THE MISSOURI RIVER HILLS

Glimpses of Conditions in the Sweet Clover Region of Northwest Iowa and Southeastern South Dakota---By Frank C. Pellett

SWEET clover is coming into its own in northwest Iowa. In the region about Sioux City there are thousands of acres covering the hills and stopping the erosion that would otherwise be cutting away some of the rich farms of that section. I have visited the famous sweet clover belt at Falmouth, Ky.; I have ridden for many miles through the finest sweet clover territory in the Arkansas River Valley and have seen many sweet clover districts of lesser fame, but nowhere have I seen finer sweet clover fields than in northwest Iowa, roundabout Sioux City. Bordering the river at this point is a wide range of hills of rich loess soil. The soil is very productive, but with continuous cultivation the humus content is rapidly removed. When this condition develops, the fields are badly damaged by heavy rain. Erosion is much more difficult to control on steep hillsides than on the gentle slopes. The farmers have learned that in order to prevent the washing of the land they must bring some crop into their rotation that provides a liberal supply of humus, or decayed vegetable matter to hold the soil. Sweet clover is ideal for this purpose, for it is a vigorous and rapid grower. In addition it greatly enriches the soil with a wealth of nitrogen gathered from the air and stored in the earth through the medium of the bacteria living in the nodules which grow on its roots.

The ideal location for the beekeeper is one where the farmers require some good honey-plant in their system of agriculture. In the sections where there is a large acreage of white clover pasture, alsike clover or alfalfa grown largely for seed, or where sweet clover is generally grown as a field crop, we find prosperous beekeepers.

In the immediate vicinity of Sioux City there are so many amateur beekeepers that the commercial beeman has much to contend with in the way of fighting disease. American and European foulbrood are both present and the beekeeper must be constantly on the alert to keep disease under control. Farther out, however in the direction of Vermillion, S. Dak., there are less bees present and some apparently ideal locations not occupied. In the vicinity of a large city, we nearly always find disease much worse. Just why this is true we can only surmise. It is generally credited to the fact that much honey is shipped in to supply the markets, that there is more or less exposure of discarded sections and empty containers which are thrown into the alley or garbage can without being washed. The fact that there are so many people with a few bees in a limited area makes it very difficult to eradicate disease, once it gets a foothold. We do know that disease has long been established in the vicinity of nearly every large city which is a market center for honey. As far as can be ascertained it has never been eradicated from the vicinity of one of these centers after once becoming established. In



Near view of the Wilson apiary shown on our cover.

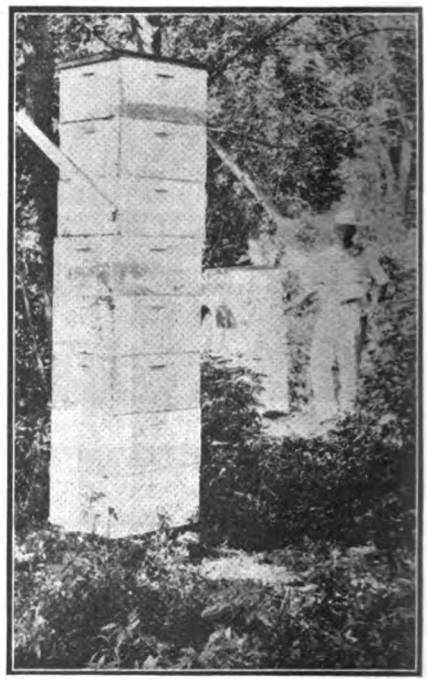
such a location the beekeeper must take the manipulation necessary to control of disease as a matter of course and give it the same attention that he finds necesary with swarm control or other timely activity.

With the extension of the sweet clover area, there has grown up an organization of beekeepers known as "The Western Honey Producers' Association," which handles a large part of the honey produced in that region. There seems to be a general impression that they are dealers rather than producers. While, as a matter of course, they do purchase a great deal of honey in the open market to supply their trade, they are essentially producers. They are very probably the most extensive producers of honey in Iowa, if not the Middle West. At the time of my visit, in July, the sweet clover flow was just on and they were operating twelve hundred colonies of bees within a radius of about twenty miles of Sioux City.

Seven or eight years ago the idea of an organization of honey producers who should market their own product through a central packing plant was conceived by E. G. Brown and Thomas Chantry, living at that time near Salix. W. P. Southworth, also a beekeeper of that locality, was interested in the plan, and they started out to form such an organization. As with most co-operative ideas, there was difficulty in holding the producers together, and while several manifested a good deal of interest for a time, they failed to stick. Chantry moved to Utah, leaving Southworth and Brown as the sole survivors of the party who started out to form their own marketing organization.

Brown had been a beekeeper since infancy, his father having been one of the first commercial honey producers in the Middle West. When Ed was 16 he left school to take charge of the bees. From that day till this he has been a honey producer and has seen all the ups and downs of the business, from a big crop and no market, to a big market and no crop. Southworth was a merchant for a long time and kept bees as a side line. As his bees increased he became more impressed with the possibilities of the business. His mercantile experience stood him in good stead when it came to marketing the crops. The packing plant had not long been in operation, when it became apparent that, in order to market their own product to good advantage, they must be able to supply their trade with honey through the entire year. This involved buying honey and packing under their own label to insure that they would be able to fill all orders promptly as received. One serious obstacle in establishing honey as a staple article has been the difficulty of providing a dependable supply. The grocer does not care to waste his time creating a demand for a product that he will not be able to supply more than six months in the year. In the past the beekeepers have sold their crop as quickly as possible after it was produced. This made a dull market at one season of the year with a bare one at another. The man who starts out to supply a regular trade soon learns that he can't get very far without being able to supply the demand constantly.

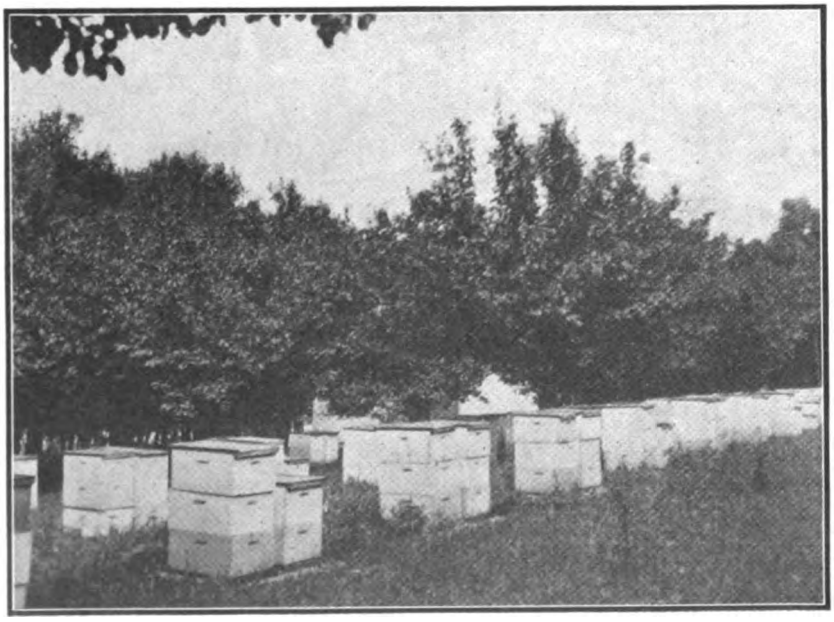
As the trade in bottled honey grew it seemed desirable to secure better railroad facilities and other conveniences lacking in a small town. They accordingly moved to Sioux City and last year erected a fine building with the latest equipment for bottling honey. The filling of the packages is done by machinery which weighs the contents exactly. Even the labels are pasted on the pails by machinery. With their own plant in operation, the handling of supplies along with honey was a very natural step. With twelve hundred colonies of bees of their own and a much greater expansion contemplated, their own orders for supplies are such that it pays to buy in carlots. What more natural then than to supply the many beekeepers in the vicinity of Sioux City?



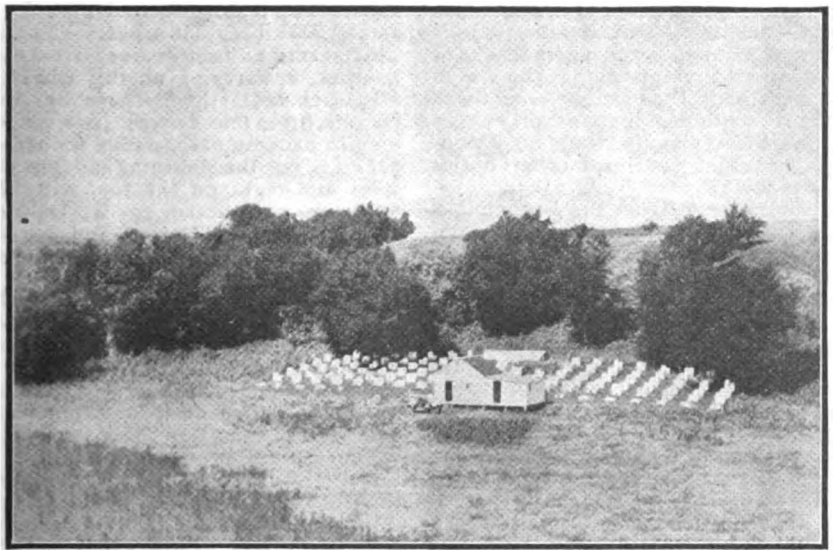
Hospital colony where brood from colonies with foulbrood is piled up till all has emerged.

Although Southworth and Brown are all that remain of the original members of the enterprise, others have associated with them since that time. Among them should be mentioned C. S. Engle, formerly of Beeville, Texas, and C. E. Kautz, formerly of Brighton, Iowa. Both are experienced and practical beemen who are now in charge of part of the company apiaries. Each man has charge of a certain number of apiaries for which he is individually responsible. Sweet clover is grown so extensively that many of their locations will support from 100 to 200 or more colonies of bees. The great difficulty is not in finding pasture but in securing a location in an accessible place, and also in getting far enough from disease centers that the bees are not reinfected with foulbrood with discouraging frequency.

Since foulbrood is so thoroughly established in every direction the best they can do is to get locations as far from other bees as possible and then be constantly on the watch for it. At the time of my visit Engle was treating a few colonies where it was of recent development. It is never allowed to advance far in any colony. The colony is treated before it becomes weakened, this making a minimum of loss with each case. His method was to shake the bees with queen onto full sheets of foundation. An excluder was placed above the hive and the brood-nest replaced. After an hour or two, when the bees had become quiet, he removed the brood-chamber and car-



One of the Western Honey Producers' outyards.



Apiary seen from the hilltop.

ried it to a hospital colony. In this way he took away all the honey, and since the bees had the brood for a short time after shaking, there was less danger of swarming out. The brood from all colonies treated was stacked up several stories high to hatch out. The picture shows one of these piles. In about three weeks all the brood will have emerged and there will be bees enough to make a booming colony. In the background can be seen a hive four stories high. This is the result of shaking one of these hospital colonies. On opening it we found that four stories of foundation had been drawn in three days and filled with honey. Foulbrood insures expert beekeepers, as otherwise it is impossible to continue the business, and make it profitable. The fly in the ointment is the sideliner who does not have to make his few colonies pay, and when they die catches another stray swarm and starts again. There are always enough of such in the vicinity of every large city to perpetuate the disease.

When I visit the big producers I am always interested to see how they cut out unnecessary labor and equipment. The bigger the concern in every line of business, the more important it becomes to eliminate every unnecessary item of either investment or labor. Too much "overhead" has ruined many a good business. With a series of outyards there are numerous problems not met with the one apiary man. There is always the possibility of a move being necessary. Hive-stands and honey-houses are desirable at every apiary, yet they are not easy to move. Most beekeepers make shift with bricks or pieces of board at outyards. Such stands require constant fussing to keep the hives in position. The members of this firm have a special hive-stand that is cheap, durable, light and easy to move. They cut a good grade of composition roofing into strips four feet long. Under each strip are placed two strips of board in the right position to support both the front and back of the hives. Over the boards is placed the roofing, each piece making a stand for two colonies of bees. Such a stand serves as well as concrete for keeping down weeds and grass and costs but a small sum. If the apiary is to be moved, a hundred of them makes but a small pile in the wagon or truck.

They also build good houses, as will be seen by the picture. This building is typical of those being built at each of their yards. It is 16x24, providing sufficient room for extracting, or storing of supers and supplies. It is built of good material and the frame is built in 8-foot sections. It is thus possible to take it down and move it at slight expense. Where the 8-foot sections come together there are two studs or rafters, as the case may be. These are fastened together with bolts. In taking down the building, the bolts are removed and the siding cut down with a saw. The same applies to the floor. In the new location the sections are replaced in the position occupied prior to the move. In this way it is possible to enjoy the advantage of a roomy and comfortable building, without feeling that it will be a loss in case it becomes necessary to move the apiary.

None of the members of this firm likes to see poor beekeeping in the vicinity. As is usually the case, a number of farmers have apiaries near by which are more or less neglected. Where a man has bees enough to justify them, they care for these apiaries on a share basis, the farmer furnishing necessary equipment to put the bees into first-class condition. In one case they paid the farmer $2,500 in three years as his share of the output of an apiary which numbered 50 colonies to begin with. It is needless to state that this particular farmer has acquired a different attitude toward the possibilities of beekeeping.

One of our illustrations shows as neat and attractive an apiary as is to be found in the entire State of Iowa. It was formerly one of the company yards, but has lately been sold to a young man, James Wilson by name, who was for a long time an employe of the concern. The same apiary is shown on our cover, as it appears from the top of the nearby bluff.

The Western Honey Producers' Association has grown up from a small beginning. It was founded on the idea that production and marketing could profitably be combined in the same organization. While there has been the usual struggle, common to establishing any new business enterprise, if one is to judge from the appearance of their fine new building, to which a third story will shortly be added to care for the growing business, of the many apiaries with hives piled two to four stories high and rapidly filling with honey, the concern will shortly grow into one of the really big enterprises

Bottling and packing plant of the Western Honey Producers' Association.

of its kind. At the time of my visit there was an excellent prospect for an average yield of 200 pounds per colony of sweet clover honey, and I was informed that such a yield is not unusual with them.

The Value of Winter Protection for Bees

By J. H. Merrill

IT is not difficult to circulate and have accepted a rumor such as "A bee will not sting you if you hold your breath," yet a fact which may be applied to practical beekeeping must be accompanied by abundant proof.

Dr. Phillips has given us, clearly, the reasons why bees should be given protection during the winter months. In spite of this, there are always plenty of people who have seen strong colonies in the spring that have wintered in cracker boxes, in hives large enough to thrust your hand in, and with no winter protection whatsoever. In fact, these colonies were so strong that they clearly proved to the satisfaction of the beekeeper that there is no need of taking any precautions for wintering bees in his locality. Another bugbear, which is frequently heard, is that there is "no need of winter protection in our locality, because we have such open winters." Some of the figures which will be given later deal directly with this point and seem to tell a very clear story.

Briefly summarized, the reasons given by Dr. Phillips why bees need winter protection are: (1) Bees are like storage batteries, containing a given amount of energy, which once expended is gone. (2) The bee is a cold-blooded animal and can raise the temperature within the hive only by consuming honey, thus transforming energy into heat, and by muscular activities. (3) When the temperature falls to 57 the bees form a cluster, with those in the center busily engaged in raising the temperature by muscular exertion. (4) If wintering conditions are such that bees can pass through the winter with but a minimum expenditure of energy in maintaining the high temperature, then these bees will have a maximum amount of energy left in the spring to carry on brood-rearing and t perform other duties in the hive.

(Contribution from the Entomological Laboratory, Kansas State Agricultural College, No. 47. This paper embodies some of the results obtained in the prosecution of project No. 126 of the Kansas Experiment Station.)

A colony that may have gone into winter quarters in good condition and appears, early in the spring, to be a strong colony, yet that has passed the winter under adverse circumstances, consuming its energy in maintaining a high temperature, will have but little energy left to carry on its spring duties.

Acting upon the theory that the best method of wintering was the one that would produce the largest number of bees at the time when the honey-flow really began, experiments have been conducted at the Kansas State Agricultural College to try to determine this point.

For the purpose of this experiment two sets of hives were used, one of which was placed in a spot sheltered by a fine natural windbreak composed of dense shrubs. The other set of hives was placed in the open where it received no protection from any windbreak. The queens in all of these hives were of the same age, produced from the same stock, and introduced the same day. As nearly as possible, the strength of these colonies was about equal in the fall of 1917. The amount of stores in each hive varied from thirty-five to forty pounds. In the fall, at the time when the bees were prepared for winter, a rather complicated system of weighing, which it is not necessary to explain here, was made to determine the exact amount of honey and the exact number of bees in each hive. For the purpose of this experiment it is estimated that there are 5,000 bees in every pound. This seems as fair to one hive as to another, in carrying on this work.

In each set of hives there was one 1-story hive, one 2-story hive, and a hive in packing case, with 4 inches of packing on the bottom, six on the sides and eight on the top, with the entrance contracted to a 1⅜-inch augur hole. The 1-story and 2-story hives had no packing whatsoever. Each of these hives was placed on a scale and daily readings of the weights were taken throughout each winter. In the spring of the year when the honey-flow had really begun, another complicated system of weighing was made to determine under which condition the strongest colonies were produced.

It is the intention to carry on this work over a number of years, and it is admitted that a larger number of hives would be preferable to the small number which are used. However, the general trend of results has been the same over each of the two years, and so marked as to indicate strongly what are the best wintering conditions for such a climate as is found in this locality.

During the winter of 1917-18, the average daily consumption of honey for the six hives for a period of 139 days, was half an ounce. During the winter of 1918-19, the average daily consumption of honey for the six hives for a period of 150 days was one-eighth of an ounce. During the early part of the winter of 1917-18, the consumption of honey was not very great. However, in January the amount of honey consumed was greatly increased, which showed that some brood-rearing began in January, and, throughout that month and the months of February and March, the average consumption per colony was about four or five pounds per month. The winter of 1918-19 in Kansas was known as an open winter, and in January, 1919, the packed hives consumed five pounds more honey than they did in December, 1918. In February the consumption remained about the same, but during March and April the amount of honey consumed was greatly increased, so that in one of the packed hives there was a loss in weight of 11⅝ pounds. As will be seen later, this honey was consumed in brood-rearing, as the colony which consumed the 11⅝ pounds was the strongest colony of the six. During the open winter, the packed hives consumed considerable more honey than did the unpacked hives. The average daily consumption of the 1-story unpacked hive, protected by a windbreak, was 1 6-10 unces. In 1-story hive, not protected by a windbreak, the average daily consumption was 2 ounces. In the packed hives, the protected and unprotected, the average daily consumption was 2 6-18 and 2 9-10 ounces, respectively. The result was what would be expected, because when the bees are rearing brood they have to consume honey. The total consumption of honey in the packed hives for 151 days was 37⅝ pounds, which in-

Honey house built in eight-foot sections to facilitate moving when necessary.

dicates how much must be left in the hives for storage, in order to winter successfully strong colonies. On May 4th, 1919, it was considered that the honey-flow had started and the spring weighing was taken, with the following results:

Unsheltered—No Windbreak

One-story hive, 11718 bees, 3 2-3 frames of brood.

Two-story hive, 16406 bees, 3½ frames of brood.

Packed hive, 36718 bees, 4½ frames of brood.

Sheltered—Windbreak

One-story hive, 14063 bees, 4½ frames of brood.

Two-story hive, 20936 bees, 3¾ frames of brood.

Packed hive, 38594 bees, 5¾ frames of brood.

Upon examining the above figures the value of the different forms of wintering is apparent. Whether protected by windbreak or not, the 2-story hives have about 5,000 more bees in the spring than the 1-story hives, and the packed hives have about 25,000 more bees. Figuring 5,000 bees to the pound, valued at $2.50 a pound, the packed hives would have $12.50 worth of bees more than the unpacked hives. The difference in the value of a windbreak is more apparent, as would be expected with the hives which were not packed, although there is about 2,000 bees difference in the packed hives in favor of the windbreak.

The comparison between number of bees in fall and in spring weighing is as follows:

	1917-18 Gain or Loss	1918-19 Gain or Loss.
No Windbreak		
1-story hive	-332	-3282
2-story hive	2808	-469
Packed	4578	22968
Windbreak		
1-story hive	4538	313
2-story hive	13346	5936
Packed hive	15132	24844

The above figures show several things. The winter of 1917-18, in Kansas, was a very severe winter, in which the bees were confined to the hives for a long time without a flight. The winter of 1918-19 was one of those open winters when, according to popular opinion, there is no need of packing bees. An examination of the facts stated above will, however, dispel this illusion. For instance in the 1-story hive, during the severe winter, there were 332 bees less at the spring weighing than in the fall. After the open winter in the same colony there were 3282 less bees. In comparing the figures of all the other hives during the severe winter, with those during the mild winter, the fact is brought out that, in a mild winter the bees need to be packed even more than during a severe winter. Another fact which is distinctly shown in the figures is the importance of the windbreak, the 1-story hive in the open had 132 bees less in the spring than the fall, while the 1-story hive in the windbreak had 4538 more bees. In 1918-19 the 1-story hive in the open had 3282 bees less in the spring than in the fall, while the 1-story hive, in the windbreak, gained 313. However, the most marked result which these figures show is the value of the packed hive. During 1918-19, while one colony of bees was decreasing 3282, the packed hive gained 22,968. While the other 1-story hive was gaining 313, the packed hive gained 24,844. The difference between the packed hive and the unpacked hive during 1917-18 was not as great as 1918-19, because packing material used in 1917-18 was excelsior and shavings, while during 1918-19 it was forest leaves firmly packed.

As stated above, more hives would be desirable in carrying on this work, but it seems to be very clearly proved that the windbreak is very valuable in winter protection, that 2-story hives are preferable to 1-story hives for the bees that remain unpacked throughout the winter, and that the difference in the number of bees, between packed hives and unpacked hives, in the spring, is so large that it has justified the extra expense incurred in packing. The fact has been brought out already that no locality may claim immunity on account of the fact that it has open winters, as these open winters are harder on the bees than a severe winter, where brood-rearing is postponed until warm weather has set in.

Manhattan, Kans.

The Queen Condition of Parent Hives After Natural Swarming

By Morley Pettit

A CORRESPONDENT has raised a question which is very important in connection with natural swarming. She has found that three of her "old swarms" have no queens, and wishes to know how to proceed.

It is a common experience where natural swarming is allowed, to find that some of the parent hives fail to get laying queens afterwards. By the time their condition is discovered they have usually become just a bunch of "buzzy bees," which are practically worthless because of their age and the difficulty of requeening them, and what is almost worse yet, they have filled their combs so full of pollen that about the only cure is to melt them down.

It is best to examine all parent colonies in three weeks after swarming and, if eggs are not found, give a comb containing eggs and very young larvæ. A week later an examination may reveal a fresh batch of eggs indicating that the young queen has got down to business. This may not prove that she was not laying before, however, for I have found **eggs only** one day, then a few days later **no eggs** in the same place. I think the workers being elderly and not used to babies, ate them.

When a young queen finally gets going well we are still not satisfied till she has enough brood capped to indicate that she is "off to a good start" and is not likely to develop drone-laying propensities early in her career.

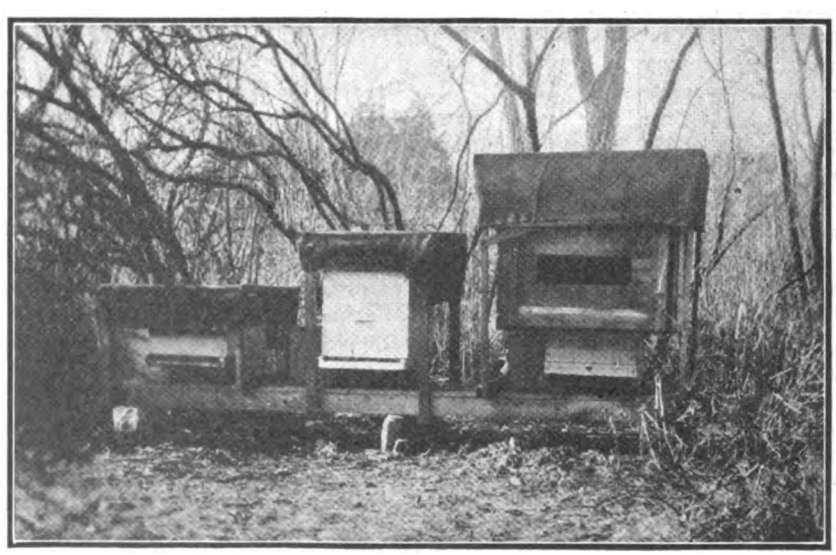
To requeen colony which fails to prove a queenright condition, we first make sure it has no queen of any kind, then place on it, over an excluder, a nucleus having a full brood-chamber of combs and a good queen. One week later the order of bodies is reversed so that the nucleus on top becomes the brood-chamber of the colony.

Georgetown, Ont., Aug. 30, 1919.

Another Short Course Announced

We have been advised that a short course for commercial beekeepers will be held at Yakima, Wash., beginning November 10 and continuing for five days.

Dr. E. F. Phillips, George S. Demuth, A. P. Sturdevant and H. A. Scullen of the U. S. Department of Agriculture, together with western men, will appear on the program. This is the first of these short courses to be held in the northwest, and it is hoped it will be largely attended.



Colonies used in Merrill's experiments.

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language. Consolidated with The National Bee Journal in 1874.

Published monthly at Hamilton, Illinois.

Entered as second-class matter at the postoffice at Hamilton, Illinois.

SUBSCRIPTION RATES—In the United States and Mexico, $1 per year; three years, $2.50; five years, $4. Canadian postage 15 cents, and other foreign countries 25 cents extra, per year.

All subscriptions are stopped at expiration. Date of expiration is printed on wrapper label.

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FRANK C. PELLETT .....Associate Editor
C. C. MILLER .....Questions Department
MAURICE G DADANT .....Business Manager

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THE EDITOR'S VIEWPOINT

Let's Play Fair

The publishers of the American Bee Journal try to use great care to make sure that no dishonest advertiser makes use of its columns. However, there is an unusual opportunity for dissatisfaction in the purchase of bees and queens from strangers. If a man sends us an advertisement to the effect that he wishes to dispose of his bees we can hardly refuse him space. The buyer should use some care to make sure that he is getting what he expects before he parts with his money.

We have a letter from a beekeeper who sent money to a well-known New Yorker for a colony of bees, in response to an advertisement of this kind. The seller made a mistake and sent the bees to a wrong address. As a result, the bees were not delivered for ten days. Most of the bees were dead and of course the colony was queenless. An order was then sent to a well-known queen breeder for a queen, and two weeks elapsed before the order was acknowledged. As a result the colony is bound to be practically worthless.

It is high time that steps were taken to place the handling of bees and queens on a business basis. Those who deal in queens or package bees should be prepared to acknowledge receipt of an order by the next mail and tell the purchaser approximately when delivery can be made. If immediate service is asked for, the money should go back promptly if the dealer is unprepared to fill the order. There have been too many disappointments of this kind the past season. It is true that the queen breeders have had, in many cases, to contend with unfavorable conditions. This does not excuse the unbusiness-like methods of some of them. The seller should remember that many customers are inexperienced and do not realize fully the difficulties of the breeders.

Several of our most extensive breeders have handled their business in a way to merit the continued confidence of their customers. These men have returned many unfilled orders, yet disappointed customers have written us pay them compliments because they were prompt and fair in their dealings. In contrast to these, several have caused complaints of short weights in package bees, slow delivery, poor packing and generally unsatisfactory service. A few have fallen down altogether, and up to the present have neither returned the money nor filled the orders.

The great expansion of our industry has been somewhat responsible for these conditions. The unusual demand for bees and queens has attracted men without sufficient experience or capital, and in such cases disappointment is to be expected.

Bees in the Bush and Trout in the Brook

Wife and I took a trip to northern Michigan, in August, and stayed at Bay View, for 3 weeks. While there we called on several apiarists of the vicinity, 20 to 40 miles away. It is enjoyable, after visiting beekeepers all through Europe, to loiter in the different parts of our own country and see the methods followed. There is always something to learn.

On August 20, we went to East Jordan, via Boyne Falls, where Mr. Ira D. Bartlett and his pleasant and pretty wife came for us at the train. In the afternoon, we left the wives at home and went to his apiaries, several miles in the country, over hills and through valleys, and by such roads as the beekeeper in the brush usually travels.

Mr. Bartlett has a way of making an artificial flow which induces the bees to breed without actually supplying them with stores. He mixes sugar with water in the proportion of one to seven, or almost a gallon of water to a pound of sugar. This makes a very thin compound, which might be compared to nectar containing 86 per cent of water. It is so thin that the bees have to be attracted to it artificially; otherwise they would not notice it. Some old combs placed on the water or the use of a little richer feed at first will bait them. After they get accustomed to the supply, they come and take it readily.

This has the same effect upon them as a light flow of nectar. It renders them peaceable and causes them to breed. It helps in the introduction of queens, as the bees are less apt to be ill-natured during this light artificial flow. I can readily see the advantage of such feed in times of scarcity.

On the way to and from the apiaries, we passed several brooks of clear, cool water, running among the pines towards the lakes, with the same hurry and lively glitter as the little streams we saw in Switzerland, which all seemed to hasten, in their course to the goal, as if they were running a race. This activity of the cool water, combined with the crystal clearness of the streams, which all come from springs running out of the shady hills, is in such contrast with the murky and quiet flow of the majestic Mississippi to which we are accustomed, that I was very much charmed, especially as I was told that the brook trout is plentiful in these little streams and may be readily seen.

As we crossed a culvert over one of these little brooks, Mr. Bartlett stopped the auto and said to me: "Step down, I'm going to show you a trout." We got down, but I vainly looked, in a brooklet about 4 feet wide and perhaps 2 feet deep, for a sign of fish, large or small. There was nothing in sight.

Meanwhile Bartlett had gone a few steps away and was kneeling in the grass, apparently looking for a lost pin or a dropped penny. I wondered at his action. But he quickly returned, with a grasshopper in each hand. He at once threw one of the

insects in the water, with enough force to make a slight splash.

With a swish and a swirl, a black streak, quick as greased lightning, appeared from under the culvert, and with a snake-like motion, splashed about the grasshopper, which disappeared and the water again became still, before I had time to notice whether the trout measured 6 inches or 2 feet in length. The second grasshopper had the same fate, though it took a second or two longer to secure the same black lightning effect.

I suspected that there might be some collusion and that Mr. Bartlett and that trout had an understanding, to astonish and deceive the tenderfoot, that I was, into believing that trouts are everywhere in those brooks constantly watching for their opportunity to grab the poor grasshopper. But Mr. Bartlett denied any connivance with that particular fish.

Well! the trouts of North Michigan must be plentiful and easy to catch, if they bite so readily? Oh, don't ask me, go and try it for yourself. I did not catch any.

Are We Good Samaritans?

The following letter is selected by us from among a number of similar requests:

"Nancy, France, Sept. 1919.

"Editor American Bee Journal:

"What help could we secure from the beekeepers of generous America, in the way of beekeeping material (excluding beehives), during the coming season?

"Nine thousand hives of bees have been either stolen or destroyed in the Department of Meurthe & Moselle. It is unnecessary to say to you that the disaster sufferers have lost also their homes, their live stock, their household goods, their orchards and that even their fields are dug up with shell holes, trenches, etc., and covered over with barbed wire entanglements.

"I am respectfully yours,

"RENAULD,

"Treasurer of the Eastern Association of French Beekeepers..

"Address, Francois Renauld, Banker, 58 Rue St. Jean, Nancy."

We doubt whether any but those of our boys who have been actually in the trenches can appreciate the present conditions in devastated France and Belgium. Distant relatives of ours who lived at Grand Pre and whom we had opportunity to help during the war, as they had been forced to run away from their village and establish themselves temporarily in the undamaged districts, kept up a regular corespondence with us during the war. At the signing of the armistice, they were overjoyed and wrote us that they were going back home to rebuild whatever was destroyed, and invited us to come back and visit them. But very discouraged letters from them followed the joyful one. They had gone back, had found the entire village in ruins, so that they could hardly tell where their home stood. There was nothing there to do anything with, no valid workers, no lumber to be had nor supplies of any kind. Yes, they were to receive pay secured from Germany, by and by, but even that money will buy but little, as all European values are depreciated. The German mark is worth 18 per cent of its normal value, the French franc is worth 60 per cent of what it used to be. That is to say, a franc, instead of bringing nearly 20 cents in American money, now brings only 12.

If our produce is high in price, if our honey sells at 20 to 40 cents per pound instead of 8 to 15, as formerly, we owe it to the suffering abroad. America has done quite a great deal for Europe, but we must do still more.

The American Bee Journal now opens a subscription to help these French and Belgian beekeepers whose entire resources have been destroyed and who even with the German indemnities (when these are paid) will still be suffering. Let the friends give what they can, queens, supplies or money. An arrangement will be made to have these supplies sent by the most economic and direct way. Let us know what you are willing to do and we will publish the list in the Journal. We will head the list as follows:

Dadant & Sons, 200 pounds of foundation.

American Bee Journal, 10 Italian queens.

C. P. Dadant, 500 francs.

Supplies of different kinds may be forwarded during the winter. The bees must go when the weather is sufficiently warm, in April-May. We understand that bees are being bought in those parts of Europe not damaged, to give a small start to the former owners of colonies in the damaged regions.

Instructions will be given to the subscribers to this fund, in time for action.

Endurance of Bees in Transit

In the December, 1918, number of this magazine, page 416, the editor gave his past experience in importing bees and wrote: "Very young bees did not prove as hardy as the active field bees, though the younger bees among the latter are best."

Concerning this statement, the present editor of L'Apicoltore,, of Milan, Italy, writes, in the June number:

"How is it that on this same matter we have diametrically contrary experience? When we sent queens to foreign countries, America included, it was precisely the workers that had never had a flight, that resisted the best during the trip, especially in the long trips, such as to Texas, to Jamaica, and even to Signor Dadant, Root etc. Other causes, we believe, must have entered in the cases of which Dadant writes, but we persist in believing that the youngest bees, not yet accustomed to outside flights, stand best the prolonged reclusion."

This matter is worthy of further investigation. What do the importers and exporters have to say?

Large Hives Vs. Swarming

E. R. Root, in Gleanings, September, page 577.

"After interviewing Miss Crowder, we hunted up her father, J. F. Crowder, of Zimmerman & Crowder, of Pasadena, and the apiary in the background where this honey was produced. Yes, indeed, there was a very pretty apiary made of three and four-story colonies, about evenly divided between ten-frame and twelve-frame colonies. Dare I tell it? And would you believe it? The twelve-framers hardly swarm at all, while the ten-framers swarm—well, just as all ten-framers do, right in the same yard, with the same honey-flow and the same management. Both Zimmerman and Crowder testified to the comparative freedom of the big hives from swarming. It is the same old, old story that the Dadants, Holtermann and others have told us for years."

(Yes, and we would wager that the wider hives yield just as many supers full, though 20 per cent wider than the others, even if the others did not swarm. That is the old story, too. with us.—Editor.)

SHIPPING EXTRACTED HONEY

BY M. G. DADANT

RECENT decisions by the Rate Committee of the Western Classification have resulted in slight advances in rate on extracted honey in different styles of containers. Beekeepers are apt to be surprised at this and wonder why the rates should be advanced when the rate on other liquid sweets is not advanced in proportion.

The fault, f course, lies with those beekeepers who are not careful in putting up and packing their product in proper manner for shipment.

A rate committee does not raise the rate on one article without reason. They take the list of claims which have been paid by the different railroad companies as a basis for formulating such increase. If there have been many claims presented for shipments of honey, the railroad company must defend itself by raising the rate sufficiently to cover the damage.

In the case of other liquid sweets, such as corn syrup, etc., these are practically all put up by large and reliable firms, that are well acquainted with the requirements necessary for getting their product through in good shape. They pack such products so as to reach the customer safely, not only to save claims and additional freight charges, but also that the product may give satisfaction.

Another thing is that these liquid sweets are usually shipped in carloads to distributors, and from these distributing houses shipped out to the retail grocers. The amount of local freight business is, therefore, very small, and the distance such freights go is usually short. The amount of damage should be proportionately small.

Of course, not all beekeepers pack their honey poorly. But the careful, thrifty beekeepers who pack their honey securely must help pay the damages claimed through shiftless packing and leakage. It behooves every beekeeper, therefore, to pack his own honey securely and urge in every instance that his neighbor do the same.

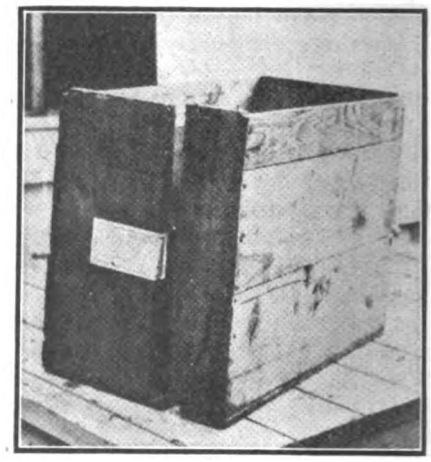
In considering shipments of honey, there are three factors which enter into consideration, in determining finally the proper freight rate. The first of these is the quality of the product, the second is the containers, and the third is the packing case in which the container is shipped.

Quality of Product

In spite of continued urging on the part of all educators and bee papers, there are still large numbers who keep bees and do not know what ripe honey is. So a great deal of honey is extracted when it is yet unripe, and it ferments after being placed in the packages.

We believe that the reader would be surprised if he were to visit any of the large distributing centers where honey is received in all styles of packages and from all directions. Many such shipments come in leaky, the cans bulged, barrels with staves broken in and in some instances contents completely gone from bursting of containers, owing to the fact that this honey was shipped when unripe, and had fermented enroute.

The honey commission merchant and the large dealer must guard himself against such shipments and the result is that the loss is prorated in many instances against the good shipper as well as the poor one. This also accounts for the fact that in many instances beekeepers are dissatisfied with returns on their honey when it left their hands in apparently good order. We recall one shipment of three or four barrels from the South which had been put up unripe. One barrel came, or at least one or two staves of the barrel came, most of it being left on the car floor. Another barrel was about half full, the other two were badly leaking.



Ends without cleats are in danger of splitting.

Another item, entering into this, is whether the honey is to be shipped in liquid or granulated form. Of course, if the beekeeper intends to hold his honey until granulated and then ship, there will be considerably less danger from loss on the road, and he could afford to use a little less strong package, although it is not desirable.

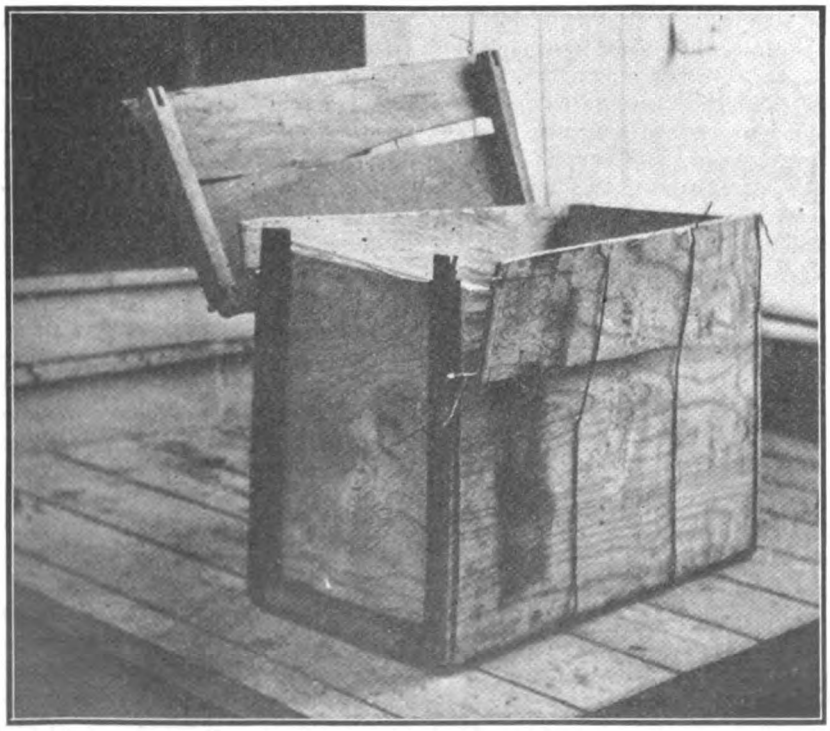
In any instance, honey that is to be shipped should be of high grade, not only to guarantee its safe transport, but that it may give satisfaction at the other end.

The Honey Container

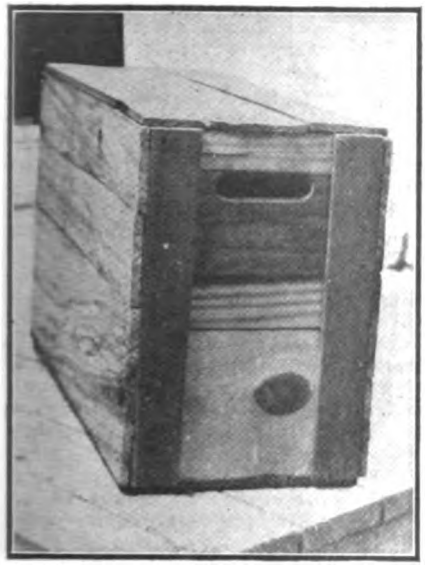
It would hardly be advisable for the beekeeper to insist upon a heavier grade of glass in choosing his glass packages. Glass containers, as made by the large factories, conform to certain standards and are sufficiently strong to stand freight shipments if properly packed. Of course, there will be the usual breakage, as with all shipments of glass.

In tin honey containers, the beekeeper has a little more choice. The ordinary friction-top pail, in the small-size pails is, of course, the best package. The other style of tops, loose fitting, should not be used in making shipment. All friction-top pails are usually made of the same standard of tin, so that the beekeeper cannot go far wrong if he orders any of the standard friction-top packages.

It is in the 5-gallon or 60-pound con-



The veneer case is too light to carry two cans of honey safely by freight, and should never be used.



A good case costs a little more, but carries its contents safely to destination and its general use would bring a lower freight rate.

tainer that the weight of the tin varies more. The beekeeper should insist that his 60- pound cans be sufficiently heavy to carry the honey he is to put in them. A tin of the basis of at least 107 pounds should be used.

Barrels, if properly made and properly packed, would make the very best containers for honey. It is probably, however, in barrels that the greatest loss occurs. This arises from the fact that the beekeeper does not buy the right quality of barrel. It must be remembered that honey, instead of soaking up the staves by giving out moisture, rather absorbs it. The utmost care, therefore, must be used in selecting a barrel which will not dry out after it is filled with honey and thus cause leakage.

It may not be amiss to mention here that it is a great mistake for any beekeeper to soak his barrels so they will be tight and hold honey. The unavoidable result of this is that honey in time absorbs the moisture from the barrel and the leakage is worse than ever. Staves should be tightened thoroughly by driving down the hoops and making the barrel absolutely honey-tight when dry.

Barrels made of soft wood and with six hoops or less are very much inclined to show leakage when honey is placed in them. In fact, we would recommend only a hard-wood barrel with at least eight hoops. The ordinary commercial alcohol barrel is the best package for honey. It is well made and will carry its load with very little loss.

In fact, in our many years of using such barrels, we do not remember of having a single loss.

Shipping Packages

The barrel requires no further packing for shipment if it is well selected and carefully tightened.

With glass packages, the container is usually furnished by the glass manufacturer and conforms to the standard set by the railroad. There is bound to be a great deal of loss in shipments in glass containers, and the freight rate must necessarily be high to offset this.

Glass packages are not usually shipped very long distances by local freight. The small producer buys glass packages and sells his honey in this shape to the local stores and the nearby towns. The large producer guards against losses by either shipping in carlots to distributing points or by carefully packing before sending out.

It is in tin packages, probably, that there is the greatest amount of variation in the style of box used. Some of the boxes are so flimsy they will hardly stand hauling to the depot, but the shippers expect them to be carried safely by the railroad company the length of several States to destination. The friction-top packages should be in boxes with seven-eighths heads and three-eighths lumber for sides, top and bottom. The heads should have hand-holds so they can be easily transported. Besides this, such boxes should be made of good, strong lumber which is not apt to split and thus damage the box through rough handling. Then, too, the amount of honey should not be so great in each box that the weight of the contents will render the box inefficient. Not more than six 10-pound cans, twelve 5-pound or twenty-four 2½-pound should be placed in one package. The lids of the buckets should be driven down tight and the lid of the box should fit against the lids of the buckets so as to prevent them from working loose. Another thing which is very often neglected is care in nailing the boxes together. Very often nails are driven inside and pierce the cans, so leakage occurs from the start. . If coated nails are used there will be less danger of their pulling out and accidentally being again driven so as to pierce the tin instead of the lumber.

If small shipments are to be made by express, of two or three cans, it is usually best, besides other safeguards, to have a handle to the box, to secure safe arrival.

The two-sixty-pound case has the greatest strain upon it, since it contains 120 pounds of honey. It would be well to have these cases made with one-inch heads and one-half-inch sides, bottom and top, with a wood partition in the center of at least half-inch lumber. This makes a very heavy case, but more expensive than the beekeeper desires. It is, however, imperative, if shipment is to reach destination in good shape, to have the heads made of seven-eighths lumber and the sides, bottom and top of at least three-eighths. This lumber should be straight grain and not shaky, and nailed with cement-coated nails, so that it will not pull apart in transit. A small additional expense on the part of the beekeeper in selecting his packages would go a long way towards securing safe delivery. It is negligence in the choice of the packages which has caused the freight advance. As stated previously, the companies have to figure upon losses paid and must necesarily raise the rate so that there be some remuneration in handling this class of freight, or else refuse the business entirely.

We would like to see a definite standard set for all styles of packages and containers. With this, we believe that the losses could be minimized and freight rates reduced. These Classification and Rate Committees are, of course, working for the best interest of the railroads, but are willing to listen to the arguments of the shippers.

Then, too, there is no distinction made between the ordinary domestic case and the export case. The export case has twice the handling at least, since it must reach the seaport, be transported on board ship, unloaded on the other side, and again hauled by railroad to destination. Export cases should be made considerably heavier than domestic cases, and this

The soft wood barrel with six hoops at left is unsafe for shipping honey. The hard wood barrel with eight hoops at right will carry safely.

is of even more importance than carefully packing the honey for home shipment. Our export market can easily be diverted to some other source if we are not careful in furnishing the best grade of honey put up in proper packages so it will reach them in good shape. There is bound to be competition on the part of other large markets, and should they furnish a better case, a better packed article, they will get the business and in time we will lose out.

The National

To the Beekeepers of America:

AT the annual meeting of the National Beekeepers' Association at Chicago last February, there was evidence of dissatisfaction with the existing National organization. Provision was made for a convention of delegates from the various State associations to meet in Kansas City on January next. These delegates will come together to put into concrete form your views of what a National Beekeepers' Association should be. Your delegates must answer the following questions and many others:

Shall the National be exclusively a social and educational organization?

Would such an organization satisfy the needs of 800,000 beekeepers?

Has the National kept pace with the development of American beekeeping?

Should the National foster the organization of co-operative exchanges in the various States and take an active part in the business life of American beekeepers?

Shall the annual meeting of the National be a social meeting with an educational program, or shall it be a business meeting of delegates from State organizations?

What shall be the future relation between the National, State and County organizations?

Shall the National undertake a nation-wide advertising campaign?

Shall membership be open to anyone, or shall it be confined to bona fide honey producers?

Shall the National maintain a paid Secretary and an office which is open for business the year around?

These are some of the questions which will come before the meeting of delegates at Kansas City. Your delegates must be present or the opinions of the beekeepers of your State will not be represented.

The well-organized States of the great West will be there. The delegates from the central and eastern States should be there to present their opinions. Nearly all organizations in the central and eastern States will hold annual meetings within the next three months. This matter should be taken up at each of these meetings. By all means send a delegate to voice your sentiments.

It is not a question of whether the National shall live or die. The National will live, but its future activities will be modified to suit the needs of the beekeepers it represents. Whether it shall represent a section of the country or all of the nation, may depend upon whether or not beekeepers from all sections participate in its reorganization. It is incumbent upon every organization to take some action on this matter.

B. F. KINDIG,
President National Beekeepers' Association, East Lansing, Mich.

Pedigreed Mating

By D. M. Macdonald

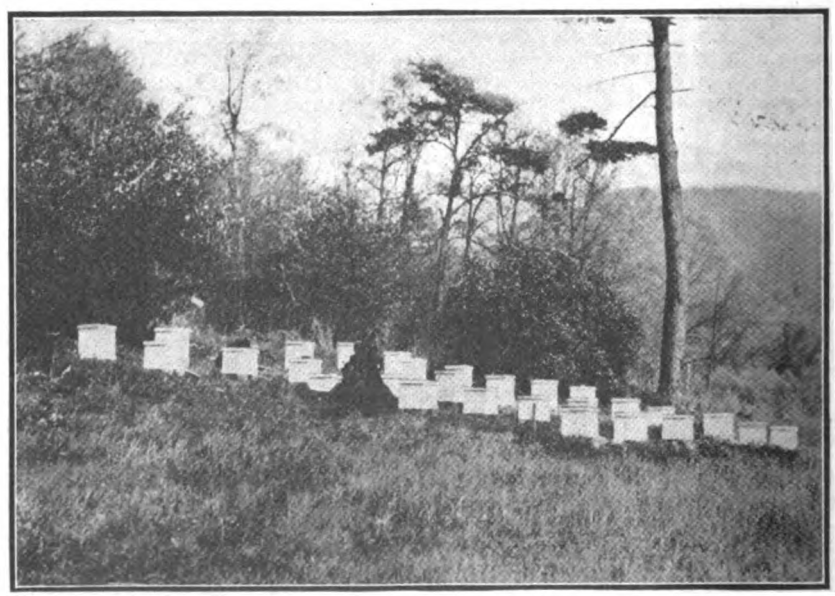
THE scheme of improved breeding dealt with in my last article (August Journal) involves the pedigree of both sire and dam for several generations. We thus secure at the start that "blue blood" on which to erect our superstructure. Building on this credit balance we can concentrate on improvement all along the line.

We have some queen-breeders in this country who work by pedigree. Year by year advance has been secured by patient and diligent work. All medium, as well as poor mothers have been discarded. Only the best of the best have been retained. Even of these the various degrees of comparison have been sifted, and the lower grade eliminated. A very high ideal has been striven for from the start and year by year the tendency has been to raise the standard nearer and nearer towards perfection. The climb up the many rungs of the ladder may be slow, but it has been steady. Healthier bees have been the result. Longer lives are claimed. Prolificness has undoubtedly been secured. Gentleness when manipulating is more marked. Faults, such as over-propolizing, have been considerably eliminated. The pedigree of each queen is noted, and a reliable record kept for many generations. All this, if carried on long enough, and if the advance is along proper lines, must tend towards the betterment of each succeeding generation. Our cattle breeders have done it, why should not we, who can rear several generations in a single season?

Isolated Stations

Some years ago a scheme was formulated in our island to improve our bees by breeding better queens on the basis of pure (and comparatively controlled) mating. Working from several mating stations in centers where the mating of tested queens and specially bred drones could be controlled, all the best procurable were to be systematically improved. These stations were to be planted down in isolated districts, or in islands off our shores, where no contamination by inferior strains was to be feared. Isolated stations, however, mean isolated work. There is here no systematic plan, no combination of effort, no concerted action. Every individual would work at least mainly for his own hand. That has been our weakness hitherto. One worked for color alone, of all aims and objects one of the most fallacious. Another worked for outward beauty, forgetful that beauty is only skin deep, and that softness and delicacy might more likely result. A third strove for gentleness, in itself a virtue, oblivious of the fact that anemic tendencies and low vitality might come up top in securing mildness of temper and disposition. Longevity was the professed aim of yet another set of experimenters. Lazy bees live long, inactive bees take long to wear out, but neither are desirables when breeding for improvement. Apart from all this there was a want of combination or preconcerted effort in all this design of isolated work without control from some central authority.

Messrs. Root, in volume XIV of Gleanings, put forward a scheme which was formulated to mate queens by drones liberated in one of the largest glass houses in the world. In spite of its size, the



New apiary started at the White Sulphur Springs resort in West Virginia. The owners expect to increase to 300 colonies in order to be able to supply their patrons with honey from their own yards, the year around. The crop in West Virginia is good this year, according to State Apiarist, Charles A. Reece.

chosen sire, I fear, would find himself "cabin'd, cribbed, confined," and it is questionable if he could put out his best effort in the race, and it is perhaps more questionable if the best of three would be chosen to act as Prince Consort. This system has long been the design of many minds and has been tested again and again only to be dropped. Artificial copulation has been only a dream, although assertions have been made that success had followed a trial. No, only in the distant depths of the pure ether can queens be mated. Man can say that only pure drones shall be reared, therefore only such can fly—thus far he has controlled true mating. Any scheme for advancing further must be the work of no single individual. I would prefer to think not even of any single State, but of your united Republic. It should be a national affair, financed by a government subsidy, and the very best beekeepers should be chosen to formulate a scheme, to lay down rules of breeding, to guide and direct the procedure. Yearly, half-yearly, or, better, quarterly conferences should be held. Data should be digested, the chaff winnowed out, the questionable grain should be rejected and only the best of the very best retained.

Nearest to my ideal of a scheme for securing controlled, pure pedigree mating, however, comes the Swiss Beekeepers' Association, with its rearing of special mothers (the dams), select purely nurtured drones (the sires), and their isolated centers up amid the Alps, where queens can be mated with an accuracy and guarantee of purity obtained nowhere else so certainly. Their procedure is no haphazard one. They act in combination on the same principle which guides them s a Republic. Every association, as in the case of each Canton, takes a part in the management of the confederated effort, every beekeeper, indeed, and more especially every queen-breeder, is a member of the league, which settles every fundamental of the scheme under which they all work individually and collectively. Well-devised rules are followed implicitly, results are tabulated, tested and reconfirmed or rejected.

Yearly, or half yearly, there is held a conference of the different breeders, where results are discussed, new plans are formed, old ideas modified, or shred as a result of acquired data, the fruits of observation and experience. After discussion further unified effort agreed on. One isolated member has an experience which he estimates is of high value. Others may have quite the contrary experience, tending to disprove its value further than a mere result of chance. The result may be a mere "sport." One man, one mind, one experience, does not count for a final decision, although it may mean further testing. When, however, ten, twenty or more chronicle the same result, working under diverse circumstances, surroundings and climates month after month, year after year, there is a weight of testimony which cannot be ignored. This even does not pass muster until it is tested, sifted, analyzed, put through the crucible. All the good is retained, all the questionable further tested and only the good put into circulation for dissemination and use.

Here is where the weakness of queen-breeding in this country and America comes in. Every breeder is a law unto himself. Each one runs his wagon on his own little line of tiny rails. What I desire is a universal railway with one gauge, under the authority of a central controlling power.

Dufftown, Scotland.

Large Vs. Small Hives

ON page 229, first column, you say, "And we, old heads in the commercial line are apt to overestimate our knowledge and make light of the theories brought forward, backed by experiments, which sometimes contradict our preconceived ideas. Much that we think we know we have to 'unlearn" or correct."

I think you are as much prejudiced in favor of large hives as I am in favor of small ones. There are several great advantages in the modern systems of beekeeping. First of all, I will name the movable frame. We will call it a handle to a comb of honey or brood, so we can take hold of the handle and remove the comb of honey or brood and put it back where it was before or put it in another part of the hive or in another hive.

If we have two different-sized frames in the same yard we are restricted and we lose one of the greatest benefits of modern equipment.

Second, I will name the divisible hive. All modern beekeepers divide their hive into brood-chamber and super, and I might say that all of them divide their super into parts, the advantages of which are too evident for me to mention.

Now tell me why some of these progressive beekeepers stick to a great big undivided immovable brood-chamber that they have to always leave in one place or have a man to help move it?

I know just what you will say. To prevent swarming; but I think we might better say, to suppress or prohibit swarming; but the bees often build little speak-easies that we call queen-cells, that they hide in the middle of their brood-nest and we have to send detectives to hunt them up.

The detective takes out each large frame, smokes or shakes the bees off and then hunts for speak-easies. Sometimes he finds them all, and sometimes he doesn't; but you all know how it is, I don't need to tell you.

When the brood-nest gets full they put most of it up stairs and then next week do it over again and hunt every week, top and bottom, for speak-easies, and so on 57 different ways, to try to prevent swarming; but the bees have 57 other ways to get ahead of you.

One big brood-chamber with two or more different-sized supers for comb and extracted honey is a very good way, and I would not say a word if I did not know a better way.

All single brood-chambers, whether large or small, are sometimes too small and sometimes too large, and with large hives and deep frames the top-bar must be heavy, the standard is seven-eighths by seventeen-sixteenths, leaving only five-sixteenths between, and if the frame above has no comb at the bottom the queen is simply prohibited from going above.

Then if the second brood-chamber has shrunk three-sixteenths and the bottom-bar covers five-sixteenths space, the queen is excluded from going above.

By using shallow brood-chambers (5 11-16) and following Fowler's new system everything is changed and 56 out of the 57 varieties of preventing swarming are eliminated and the poor beekeeper's nerves have a rest. No swarming, and the maximum yield of honey with much less work, and no worry.

The notion that the queen either likes to lay, or that she does lay in a circle is most all imagination.

In the cool spring and a cluster of bees to keep the brood warm, the brood is in a circle, simply because there is no other warm place to lay.

People on a cold day form a circle around a hot stove, but it is a love for the stove, not the circle. On the last of May I hived a new swarm of bees (11 pounds of bees) and in four weeks they occupied 8 chambers and the queen laid in every one. The next day, after putting on the eighth super, there were eggs in it. There was brood in 28 frames at one time.

She commenced at the bottom super on the sunny side, and after laying in 5 frames she commenced in the second super on the sunny side, and kept on the sunny side until she was in the 5th super, then she laid in 8 frames, but kept away from the north side of the hive.

This is an experiment that contradicts our preconceived ideas.

I have 20 swarms of bees that are giving me more honey than ever before, without a single swarm, in fact, without a single queen-cell. This, also, contradicts our preconceived ideas in regard to swarming. Other bees near by were swarming more than usual. I bought two 3-pound swarms from a lady with bees in the top of the house, no other bees near.

Of course, I would have to try my system for years and years to prove that it is an absolute prevention, and even if I know how to prevent swarming, I am like many others that do not always do what they know how to do. C. E. FOWLER.

New Jersey.

The above letter evidences exactly what we hold, that in large hives the queen usually confines herself to one story, while with shallow hives, she roams all over a num-

ber of stories. The writer of the article seems to think that that is what he wants her to do; we don't. We want our queen below, in a story that is sufficient for her. As for hunting queen-cells, we never do it, as it is unnecessary with our management.

It may be that we are prejudiced upon this matter, but if we are, it is after constant trials of both styles, large and small brood-chambers, in large numbers, and we doubt that our correspondent and critic has had a similar experience on as large a scale.

As to an **absolute** swarm prevention, we do not believe there is any such thing, or ever will be. C. P. D.

What the Newspapers Are Saying

Serious, Ridiculous and Frivolous Extracts From News Dispatches About Bees

Bees Re-Steal Honey

Lawrenceburg, Ind.—When Robert E. Terrill went to his storehouse to get a quantity of honey he had taken from his swarm of bees, the honey was gone. He supposed thieves had taken it, but later noticed bees about the storehouse, and made the discovery that they had carried the honey back to the hives, gaining access to the storehouse through a keyhole.—Greensburg (Ind.) News.

* * *

Bees on a Missouri Farm Follow Plane Loaded With Flowers

Patterson, Mo.—The latest thing in air plane stories comes from the bee farm of Madden Polk, near here. It tells how a colony of the honeymakers were stampeded by an aeroplane passing over the farm carrying a cargo of flowers. After the bees had made their hurried exit it was learned that the flying machine was carrying a cargo of magnolia blossoms which filled the air with fragrance. When the bees on the Polk preserve got a whiff of the unusual aroma, they left in swarms, it being estimated that a half million in the 50 colonies on the Polk place forsook their hives and flew after the plane. There were enough young bees left to protect the hives, but Polk had dismal visions of the luscious honey somebody else would gather from the runaways.—Poplar Bluff (Mo.) Citizen.

* * *

Unique Use of Plane

If Nelson W. Peck had gone up in an air plane a year ago instead of waiting till this morning, he figures that he would have saved $10,000, though it cost him a dollar a minute to stay up for an hour and a quarter this morning.

Peck is one of the leading beemen of the valley, and, instead of the 1,000 stands he had a year ago, he has now only 250. Bees in the others were killed by absorbing dissolved spray. "From the air plane I could pick the proper places in which to put my stands,' he says. "I located such places by automobile, but did not notice, from ground level, that there were orchards to which the bees will have easy access. From the plane I could see which stands should be moved and which can be left. I expect to make three more trips before I have finally placed all my bees."—Yakima (Wash.) Republic.

* * *

Migratory Beekeeping

Paulding, O.—Dr. Kohn & Son, who operate an apiary at Grover Hill, this county, recently received a car load of bees from Apalachicola River, Fla., to aid an experiment by S. W. Summerfield, Toledo, owner of the bees, and Dr. Kohn on migratory beekeeping.

The bees have already produced 50 barrels of honey. After "work" this summer they will be shipped back to Florida. The freight on the car of bees amounted to $455.64—Toledo (O.) Blade.

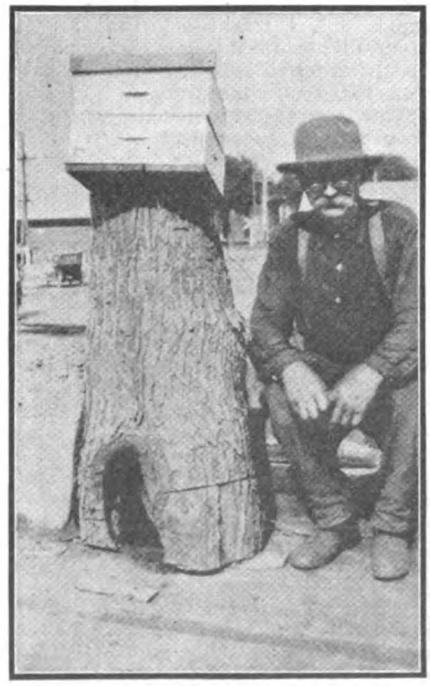
* * *

Bees' Stingers Make Profitable Crop

Raising bees for the stings pays an eastern woman better than keeping them for the honey which they would produce. From these stings is secured the purest formic acid obtainable, and the customers are the manufacturing druggists of the country. During the past 24 years this woman has supplied one firm with 25,000 annually, other concerns take from 500 to 5,000 each year, making a yearly trade of 50,000 stings. To produce this number but two colonies of bees are necessary, while it would require 50 colonies to make an amount of honey equal in value to the stings.

The manner of taking the sting from a bee is simple. The bees are first gathered in a specially arranged box, by shaking a comb on which they are working, over the mouth of the box. Next, in a room with all the shades but one drawn, the box is opened. As the bees come out of the box they are attracted to the lighted window, and cluster there on the glass or screen. Mrs. Beekeeper picks up the insects by their heads and, holding them under a magnifying glass, draws the stings. For this purpose a small pair of tweezers is used. The stings are placed in a dish filled with milk sugar, which covers them with a coat that prevents decay.

Each sting contains a small amount of formic acid, which is removed by distillation. This acid is used in the treatment of rheumatism by homeopathic physicians, being administered in much reduced strength, while doctors of the regular school use it, reduced one-half, for restoring circulation in cases of paralysis. Formic acid was one of the first of the solid-fat acids discovered. It was originally obtained by distilling common red ants (Formica rufa) from which the name is derived.—Popular Mechanics Magazine.



J. H. Warren of Elliott, Iowa, appreciates a bee-tree.

More About Santo Domingo

By H. Brenner

AMONGST the letters enquiring about beekeeping conditions here, the most interesting was from Mr. P. F., of Conastota N. J. I will answer his enquiries first.

The cost of living is prety high here, but I think a beekeeper will find at once free living for his work and knowledge, and it won't be long before he can earn wages, start apiaries on shares, or establish himself if he has some means. Three years ago I worked in Porto Rico for my living and gained my knoweldge of tropical conditions, etc., without spending my money. I am only sorry I did not come immediately to Santo Domingo. I have not traveled on roads yet. We established apiaries on river banks, sea shore or along the small railroad we have here. There are several beekeepers in Sanchez, inside a mile or two, with at least a thousand colonies. Two of these men understand English.

The most serious drawback is the lack of reliable help. Health conditions I do not know, except that I never have been sick, and my health is improving, or I would not stay. California, which I visited four years ago, did not agree with me. I am an old man, nearly 60 years old, and I have not found a native yet who can outdo me in manual work. Do not send me stamps. It is prohibited to export stamps. Every letter is opened by the censor.

About passage: The Lloyd line sails about twice a month from New York, direct to Sanchez, and from there to Santo Domingo City. The same steamer returns within four to six days. Passage is about $40. My opinion is that the more our countrymen settle here the better it will be for our glorious country.

Three weeks ago I crossed the mountains with three men and a pack mule to establish an apiary in Cabreras, where we had 80 colonies in hol-

low logs, waiting to be transferred to frames and foundation. The next day I sent two men with a pack mule to the hamlets around to buy all the gasoline cases that they could find, take them to pieces and transport them to the apiary, where we nailed them together to serve for supers. Then I put them to nailing and wiring frames, which had been sent ahead of us around the coast in a sailing vessel, and putting in foundation. I made six bottom-boards and three scaffolds for the transferred colonies out of timbers from a wrecked vessel, which I found plentiful at this part of the shore. For tops I used boards from cases, and on top of the board a leaf of the royal palm to cover the cracks. When we transferred the seventh hive I used the bottom-board from the first one, and so on. Each colony had about 2 or 3 transferred combs with brood and 3 foundations. The fourth day I found a colony queenless and concluded to go back to Sanchez to get a breeder to rear cells. So back I went with my favorite man. I found more work than I expected and other things also kept me from going back until the eighth day. When I went back with my breeding queen in a two-frame nucleus, about an hour after we left the mountains it started raining, and let me tell you it came down in buckets. I wished my friends in southwestern Texas, who are needing it, had the hundredth part of it. I did not have any raincoat and my umbrella was of no use in this downpour. The natives have little clothing and don't feel the rain. It rained continuously. We crossed two rivers, and towards night we reached a saw-mill, where the American manager had a nice waterproof tent. I stopped, had supper and hot coffee with him and borrowed his raincoat to finish the trip. We arrived in Cabreras at 11 o'clock. At the saw-mill I made primary arrangements to have lumber sawed and dressed for supers, bottom-boards, dummies and apiary houses. I first provided for my queen, which I had protected carefully from the rain. I put her on her stand, covered the wire screen with oil cloth and opened the entrance and found the old lady th next day in excellent condition, looking for empty comb to lay in. I found material enough to make 25 supers, etc., and sent to Sanchez for help, which arrived in two days.

I found that the colonies I had transferred (four of them the hands had filled with foundation) had drawn out every foundation and built large pieces of comb on the bottom-bar of the frames which the queen used, and the bees filled the comb with nectar. I did not have lumber enough for bottoms, so I used the top-boards for bottoms and covered the colonies with palm leaves.

I had a letter of introduction to Senor Don Domingo Rosario, in Cabreras, at whose very hospitable home I spent a pleasant day. I am indebted to Don Herman Eckoff, af Mantanzas, for his hospitality and help in my difficulties. Don Herman is a physician and druggist, speaks fluently French and English and has an unusually good college education. What is mostly to my liking is that he takes an interest in apiculture.

On my home trip over the mountains we had to lift one of the horses and the mule out of a moat into which they sank to their bellies.

This has been the most eventful trip I have had on the island.

Mystic Uses of Beeswax and Honey in Religious Customs of Macedonia

By Rev. Henri Tabusteau

EVERYBODY knows that the Catholic Liturgy has a formal regulation to perform the celebration of mass with candles of pure beeswax only. Similarly, for the benediction of the Holy Sacrament, six wax candles must be burning on the altar. The church, in addition, in the admirable ceremonies of Easter eve, sings twice the praise of the mother-bee, queen of the little family that gives us the sweet-smelling beeswax.

A stay of nearly two years in Macedonia has enabled me to ascertain the fact that their orthodox church is not on this matter in any manner behind its Latin sister; on the contrary, the perfumed products of the hive occupy in the Greek liturgy and customs a very honorable place. I wish to tell here, to the glory of the bees, what I have been able to see and learn over there, on this subject.

The first object that strikes the visitor, when entering an orthodox Greek church, is a sort of high, long table, a counter near the door. Upon it are spread 6 or 7 bundles of wax candles, the largest of which are of the size of a man's finger, and about 20 inches long; the smallest, of about the size of a child's finger, are hardly 6 inches long. These candles are of absolutely pure beeswax and their sweet odor scents the entire building. Each member, upon entering, buys one of these candles, according to his or her means, lights it, walks around the nave and the chapels kissing the holy icons, leaving the lighted taper before the one icon which is the more particular object of his or her worship.

There are no religious ceremonies here without the use of those wax candles. I was present once at the funeral of a little girl. Each person held a wax candle in hand and did not extinguish it until after the three prostrations and the touching homage of a last kiss on the poor angel face, in which no life but the next was shining. Here, at the funerals, the dead are always dressed in their finest clothes.

But before describing the cult of the dead, let us tell of the living, and show what place honey fills in divers ceremonies, which are celebrated at births, at the early birthdays and at weddings. I will close by telling what I saw at Christmas.

As soon as a child is born they uplift over its head both bread and salt, as symbols of the abundance with which they hope its life will be blessed. Then, to drive away disease and conjure bad luck, they fasten a clove of garlic to its little cap and place an onion under its pillow. Then a large loaf of bread, marked with three crosses and the crust of which is entirely covered with honey, is placed near the mother's bed, with a glass of wine and a glass of honey on each side of the loaf. The following morning the midwife moistens with the wine and honey the lips of the child and the breasts of the mother. As was explained to me, wine symbolizes the strength, the health which they wish to the child and the mother, and honey symbolizes a long and happy life.

The day upon which the child begins to walk alone is cause for great rejoicing in the family, and a very curious ceremony. It is upon that day that they expect the child to reveal the future avocation, and in the following extraordinary fashion: In the center of the largest room of the home, where the entire family is present, they place a large butter-cake, liberally covered with honey. Around this cake they place objects of all kinds, money, wheat, writing material, scissors, trowels, hammers, etc. The young mother then allows the child to leave her arms. The first object that he will seize with his grasping little hands will indicate the profession that he will follow some day. If, happily, he takes to the cake first, it is a sure sign that he will prosper, almost without needing to work—a very desirable thing in the Orient—until the days of the greatest old age.

Every Macedonian wedding takes the form of a real event, not only in the families of the wedded, but in the entire village. The multiple and complicated proceedings which precede, accompany and follow a wedding extend from the Wednesday of one week to Thursday of the week following. The ceremony proper always takes place on Sunday afternoon. I will describe this ceremony only from the matter in which we are interested.

On the morning of the wedding, the groom knocks at the door of the home of his affianced. A choir of young men accompany him and sing:

She has shut herself in, the blonde young girl;
What shall we offer her, so she may open the door?
We have given her a vine and grapes
So she might open to us;
We have given her a branch of quince.
She did not open the door;
But we are offering to her a betrothed;
She will surely open the door; yes, she will open it.

A choir of girls answer from within:

Knock at the door and open it, brother-in-law,
To see the young bride,
Adorned and standing ready.

The door then opens. The groom

places his foot three times in succession upon the foot of the bride, to signify that she is to submit to him; then he circles her head with a silver thread to signify that she must think of no one else. The bride's mother then offers to the young couple a mixture of wine and honey, and throws to the floor between them whatever they leave of it, saying: In as much as those drops may not be numbered, so your days of happiness."

When the crowd leaves the house for the church, the mother throws at the young couple handfuls of wheat, in sign of abundance. A brother of the groom—there is always a brother of the groom, as the families are very numerous—walks at the head of the procession, holding in his hands a red scarf. The bride is either seated upon a horse or on one of those carts which are usually drawn by slow, black oxen. During the trip, the maids of honor sing the bride's song.

At the church the ceremony consists mainly in the placing and exchanging of wreaths, the nuptial veil being extended over the couple during the entire time of benediction. The rings have already been exchanged at the time of the engagement.

At the end of the ceremony the crowd meets at the home of the young man, where the wedding banquet is held. It would take too much space to describe this.

The next morning the bride's mother calls for her daughter's undergarment, which is examined to establish the undoubted honor of the young woman. A dance is organized and the crowd sings "The Honor of the Chemise," while drinking brandy sweetened with honey. (Compare with Deuteronomy xxii, 13-20.—Translator.)

The precious garment is placed in a casket and brought to the home of the bride's parents. There is served a breakfast composed of honey and cheesecakes. A larger cake of the same kind is divided into 4 parts, for the bride, the groom and the parents of both.

After this meal the young woman accompanies her husband to the forest, or to the wood-pile, where he is expected to cut, with a single stroke, whatever piece of wood he attempts to chop. If he succeeds, it is a sign of happiness. The young woman then prepares the noon meal for themselves alone. After that meal they visit every room of their home, and in each room make a triple sprinkle of holy water. Then a great honey cake is brought, ornamented with three branches of quince, and all withdraw after having partaken of this symbol, perfumed for a sweet, and long life.

The Cult of the Dead

As soon as the moribund dies, the oldest member of the family ties its jaws with a handkerchief and closes its mouth with beeswax. Then they place within the joined hands a small cross, made of beeswax also. They then hasten to prepare the "collybes" (Greek Kollis, round loaf), or funereal cakes, which are made of a mixture of boiled wheat, dried fruits and honey. The funerals are conducted within the day following. During the psalm-singing and the prayers, the priest swings the censer over the corpse and over the assistants. After three prostrations, the friends and relatives kiss once the face of the deceased. The coffin is closed at the arrival at the cemetery and only after the eldest of the family has untied the chin and loosened the garments of the dead, whose soul is to be liberated by their prayers. The body, when lowered into the grave, is sprinkled with libations of wine, oil and honey. This impressive ceremony, which I often witnessed, reminds me of the passage of Odyssey, where the divine Ionian songster shows Odysseus invoking the shadows while pouring into the grave, dug with his sword, libations of milk, honey and wine (Odyssey xi, 27). Achilles, also, is shown placing near the funereal bed of his friend Patroclus amphoræ or jars filled with honey and oil (Iliad xxiii, 170). Honey, which is for the living a symbol of long life, as mentioned previously, evokes towards the dead the thought of eternal life, immortality. Herod reports that the Babylonians embalmed their dead in honey (i, 198), and that the Persians covered the corpses entirely with beeswax to preserve them (i, 140).

The funereal feast is served about the still open grave. The guests divide among themselves the "collybes" and eat holy bread dipped in honey or in wine. A similar ceremony is performed the 3rd, 9th, 15th, 21st, and especialy 40th day after the funeral. The collybes will on those days be distributed at the gate of the cemetery. At the head of each tomb may be seen an earthen tube and a flat stone, often sheltered with a small arch. On this stone they light a wax candle or an oil lamp. The tube receives the libations, incense and collybes, the share of the departed. Every Saturday, for three years, they will be faithfully brought to this grave. In the third year they celebrate a second funeral. The exhumed bones are carefully washed in wine, placed in a little casket and deposited in the ossuary of the cemetery.

Christmas Eve

The eldest of the family has previously brought from the forest a "badgnath" or Yule log. It is brought to the home with solemnity. On each side of the door, two wax candles are lighted. The master of the house and his wife throw a handful of wheat at one another and drop some on the Yule log. Then the latter is completely coated with honey. All the members of the family, after kising one another in pairs, lick the honey from the sacred log. It is then laid in the fireplace and the housekeeper goes out with the children. She soon returns bringing a little bundle of straw, walking about the room three times, while imitating the call of the mother-hen. The children follow her, answering with the imitation of the chicks, peeping, and catching blades of straw which they drop on the floor. Then all sit down and have a feast. The Yule log is not allowed to burn itself out, but a portion of it is preserved for the ensuing year.

Written at Salonica, Sept., 1918.
Translated from L'Apiculteur.

The Langstroth 13-Frame or Square Hive

By C. F. Davie

A FEW observations noted in the operation of the Langstroth 13-frame hive may not be amiss at this time, when discussion is rife as to the desirability of utilizing large hive-bodies. I commenced beekeeping with the ordinary 10-frame hive, but, having realized these do not provide sufficient brood-space, I recently decided to adopt something bigger. While appreciating all that has been said for the Dadant hive, I preferred to have a style which would accommodate the same size frames already in use, and thus enable the free interchange of my drawn combs. Accordingly, last winter I made up ten large 13-framers—veritable barns. When finished I contemplated them with much satisfaction. They are 20¼ inches square and accommodate 13 frames snugly, with a nice quarter of an inch to spare on one side, to permit of easy manipulation. Fancy that great box full of bees, thought I. Fancy, also, the large entrance, running the full width of the hive, as a means of ventilation. And then, if I desire, I can give my square boxes a quarter turn and winter my bees on the warm plan. I waxed enthusiastic. With more than sufficient brood-space, according to the Dadant calculation, I ought certainly to have the minimum of swarming, and the queens would stay below without the use of excluders.

But the anticipated results failed to materialize. Far from it. As a swarming preventive, the barns were an egregious failure. As a means to keep her Ladyship out of the supers, they were equally futile. The first swarm of the year went out of one of my barns. Curious, thought I—thirteen frames below and a super of an equal number of shallows above could not possibly be filled by the end of May. And this conjecture, at least, was true. There was nothing in the super, and several outside frames below had still untouched foundation. The second swarm of the year went out of another of my barns. And it was **some** swarm. Unfortunately, I was absent on business when the event came off, but my wife says it was the largest she has seen or ever expects to see. She made heroic efforts to capture it, even cutting down a tree the swarm had settled on, but the bees went to a still more inaccessible place, camped all night, and departed the next day. Curious again, thought I. There were two supers on this hive. I opened up and found the foundation in four outside frames below untouched, but brood in the central part of the two supers.

Having now found the facts, let us apply the law, as the judges say. I

stated that, according to the Dadant calculation, I had more than sufficient brood-space. This is true. But I had half of this space in the wrong place. That brood-space should undoubtedly be in the center of the hive, not branching out sideways. Her Ladyship will branch sideways for a matter of five or six Langstroth frames, after which, if not excluded, she goes up stairs in preference to leaving the center of the house. Even with an excluder, I fancy I could not get all that row of thirteen frames occupied by the bees. let alone the queen, unless, perhaps, I spread the brood every little while.

In my experience, therefore, the barns do not justify their existence, and the practicability of the Dadant hive, with deep frames to accommodate an amplitude of brood space in the center of the habitation, becomes significant. This coming winter I propose making Dadant hives for use next season, and this time next year I hope to announce the result of my operations with these hives, as a means of reducing swarming and obviating the use of excluders.

British Columbia.

(Good! But bear in mind, please, that the prevention of swarming is not **all** in large hives. There are other conditions necessary. Even then, as Dr. Miller says: Bees never do things invariably.—C. P. D.)

Electrical Imbedding

By Will H. Gray

BY using the following method, imbedding becomes "a thing of beauty and a joy forever." The actual time taken to imbed the wires is about two seconds and the work done is perfection. The first method is for those having at their disposal electric light, either direct or alternating current, from city mains or private lighting system.

Take the cord belonging to a toaster, iron, or other similar device, and cut one strand of the twisted cord and unravel a foot each way. Then pare the ends, exposing the copper, and twist them each round a nail in the end of two short sticks which just act as handles. Now connect up your cord and toaster or other appliance, when it will be apparent that by touching the nails together you complete the electrical circuit and the appliance heats up. Now, instead of touching them together, touch the beginning and ending of your wired frame, which is, of course, resting on the imbedding-board, and the wires will immediately sink into foundation, all at the same time. If the frames or foundation are uneven or light weight a slight pressure may be necessary to bring the wire exactly to the mid rib, where it should be.

Now, if you have not got the lighting system, but have a car with a storage battery, you can do equally good work, but you will not need the toaster, as the wire itself will act as sufficient resistance. Only in this case be careful not to touch the nails together, or you will spoil your storage battery.

I have not tried it out, but I think a Ford magneto would do the same work, only it would hardly pay to keep the engine running during the operation.

Electrical imbedding with high voltages is just a matter of having the correct resistance in series with your foundation wire. Resistance can easily be made for the purpose from iron wire wound on a framework of nonconducting material.

If the diagonal system of wiring is used, the current must be applied twice; that is, at each end of the straight run, otherwise the current would turn back when it touched the other wire at the middle point.

British Columbia.

BEEKEEPERS BY THE WAY

Millen, of Ontario

F. ERIC MILLEN, recently from Iowa, but now of Ontario, is generally recognized as a coming man in the beekeeping field. As a graduate of the beekeeping course of the Ontario Agricultural College, under Morley Pettit, Millen was, perhaps, the first man to specialize in beekeeping during his college career and follow up this special training in charge of similar work in another institution. Soon after his graduation he was selected to take charge of the beekeeping work at the Michigan Agricultural College. His work there was just beginning to come to public attention when he resigned to take the position of assistant professor of beekeeping at the Iowa Agricultural College at Ames. At about the same time the new law creating the office of State Apiarist went into effect and Millen was selected for that position also.

There is a good deal of action at the Iowa College and it takes a live one to get any particular attention there. However, Millen soon had everybody in town talking about bees. The war was in its early stages and many new activities were started looking toward increased food production. Millen asked permission to give the girls in the domestic science department a special course in beekeeping, since many of them were from farm homes, where bees are kept. He was informed that the girls would not be interested in bees, but that he could make up a class composed of the few who could be induced to undertake the work. The class started with about half a dozen, but it grew larger every day until there were a hundred taking the beekeeping course. As the apiary was beside the trolley line, the whole town was soon talking about the bee class of college girls and the way they handled the bees. It was not long until several faculty members were attending this course also.

When Millen decided on a correspondence course, he was told that if he could get a couple of dozen students for it, the course would be worth while. He had more than three hundred taking it shortly.

Millen has that happy faculty of innoculating others with his contagious enthusiasm. Not only that, but he is thorough-going and practical. His is not the type of booming that makes everybody think they can get rich with a few bees in the attic. He gives the impression that beekeeping is a dignified calling worthy of serious attention, and makes a fellow think that he must master the thing or get out of the game.

During recent years he has maintained apiaries in Michigan and Iowa for commercial honey production. In this way he has kept in touch with the practical work while adding to his income. When it was recently reported that Millen had resigned his position in Iowa to return to Ontario as head of the department from which he graduated, there was general regret among Iowa beemen.

We happen to know that several institutions had their eye on Millen. There is also plenty of activity in his vicinity, and while the Ontario bee department has always ranked as among the best, it is confidently expected that Millen will arouse new interest in the work.

Millen of Ontario.

Shade for Bees

IT was the late E. W. Alexander who first observed that colonies under a dense shade did not build up in spring as would those more exposed to the sun's heat. Others have found dense shade at that time detrimental to the welfare of bees only in the early and cool part of the day. Colonies, therefore, placed to the east of trees or buildings, did as well as those in the open.

Contrary to all such experience, some of our strongest colonies, producing the highest yields, were situated snugly against the west side of a building. This is but an isolated case, however, and does not prove that bees do not generally need the morning sun.

Hives with a single thickness of board for cover should, on the other hand, never sit directly in the hot sun, through the warmest part of the summer. Fortunately, such covers are gradually being replaced by the double kind, which do not warp and twist, and that have an air-space between, keeping the inner one, at all times, comfortably cool.

L. E. KERR,
Ft. Smith, Ark.

Honey Production for Home Use

By C. T. Ohlinger

I ONCE asked an old farmer why he didn't keep bees in order to get some honey for family use. He recalled that his father killed all enthusiasm for beekeeping when he cautiously advised "My boy, if ever you want to see your money fly, just keep pigeons and bees." The inference was that neither brought any money. I'll not stop to contradict such a sweeping statement. There are farmer beekeepers who get little or nothing from their bees. It's not the fault of the bees.

In the first place, it must be remembered that not every section is adapted to honey production. In some parts of the country bees scarcely make a living, to say nothing about a surplus they might store for their owner. Then, again, the question of quality must be considered if the honey is to be sold to storekeepers or private customers. At present I am in a locality where these conditions obtain. The so-called Eastern shore of Maryland is not a clover belt, the main crops being wheat, corn and tomatoes. The forests consist of pines and oaks, very few, if any, basswoods. To go into extensive beekeeping in such a locality would, indeed, be a waste of time and money. Yet we are not without bees. There's a "sprinkling" of hives throughout the whole peninsula which is not devoid of honey-producing flora, such as locusts, wild flowers, sweet clover, etc.

Now I find, traveling up and down the State, that many farmers still cling to the old and much-decried box hive. They have the shape of a chimney, one foot square and four feet high with two cross-sticks in the middle to hold the combs. Most of them are old relics and heirlooms of days gone by, bought at public sales with the bees in them like a cat in the bag. Some are of recent construction. Not long ago I caught a farmer beekeeper **in flagranti** sawing out the lumber for one of these makeshifts. Of course, he didn't know what he was doing.

I told him that I very much preferred the old logs cut out of a bee-tree, since they were not apt to warp or show any cracks. He couldn't understand why I objected to a hive of such simple construction, since he always managed to cut a dishful of honey out of it in the fall. To convince me he opened one in which the bees were working "right smart." Of course, the bees were working from the bottom up, struggling to fill the gap between the cross-sticks and the cover made by the previous "cutting."

He had never heard about shifting the hive to another place after the swarm issued and putting the new swarm on the old stand. Getting surplus with this man was very much like being lucky.

Others again, I find, are using modern hives without a bit of foundation. The combs in them are built criss-cross and are left that way. They never have the intention of moving a frame for the sake of inspection or manipulation. The bees see to it that their brood-chamber becomes a sealed book to the farmer. Of course, a super is put on. Just when to do it is a matter of speculation. I remember one day in July, as I was bringing a load of new comb honey to market, a man who kept over a dozen hives asked me to sell him some foundation so that he might put on his supers to get the new crop. It is evident that keeping bees is equal to "seeing your money fly" when managed in such a way.

I could never understand why some farmers persist in using a comb honey super instead of a plain extracting super, half depth size, when they want honey merely for their own use. A super fitted out with open frames and foundation is entered more readily by the bees than a comb-honey super with its many little compartments. Swarming is also deferred, if not given up altogether. Thus the matter of surplus is not quite so problematical. The honey can be cut out of these frames and packed into glass jars. If it's stored away in sections there is a chance for the moths to ruin it. Besides, the honey gets an unappetizing appearance if stored in sections that are used several seasons.

Cambridge, Md.

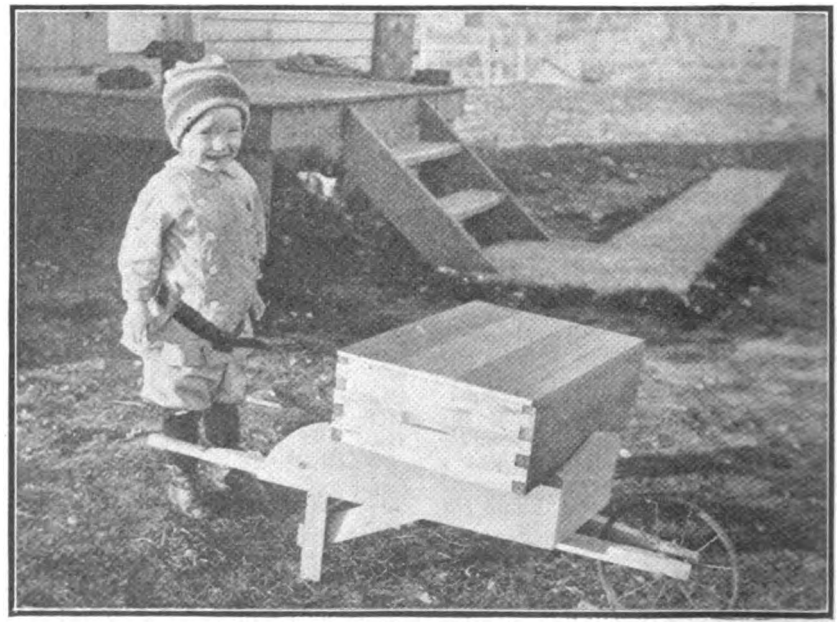
The Naming of Nails

By J. A. Green

THE article by Major Shallard, in the August number, and the editor's comments thereon, are interesting to me and I would like to pursue the subject a little further.

In the first place, I think our names for the sizes of nails are not distinctively United States, but something we have inherited from England. If the Australians use another system, they have gotten farther away from the mother country in this respect than we have.

There is another explanation for the origin of our way of naming nails than the one given by the editor. Both are recognized by the Standard Dictionary, but the one I shall give I consider the more reasonable of the two: When the English nail maker hammered out his nails by hand, he called the nail, a thousand of which would weigh ten pounds, a ten-pound nail, or in his dialect, a ten-pun nail. If a thousand weighed four pounds, it was a four-pun nail. Ten-pun easily became ten-punny, and that was readily changed to ten-penny, as we have it now.



Bringing home the honey. We have lost the name of the boy, as well as of the photographer who sent the picture.

I know nothing of Australian trade customs, so I must admit that Major Shallard is probably right as to the way their nails are named. Yet I cannot help wondering if he is not mistaken in some respects. In the United States the small wire nails so much used by beekeepers, as well as some of the "standard" sizes, are listed both by length and diameter. Thus I have nails that are 1¼x16 gauge. The nail that is probably most used by beekeepers is 1x18 gauge. You will find this on the package. Some lists will say that it is made of No. 18 wire. Sometimes it is called simply a 1x18. This does not mean that it is 1-18 of an inch in diameter, but that it had been made of 18-gauge wire. As a matter of fact, it is about 1-20 of an inch in diameter.

But when we come to talking about wire gauges, we come to "confusion worse confounded." The Americans have one standard of wire gauges and the English have another. In fact, the English at one time had two, and I am not sure that they are not both still in use.

Grand Junction, Colo.

An Expensive Friend

By Dr. J. H. Merrill

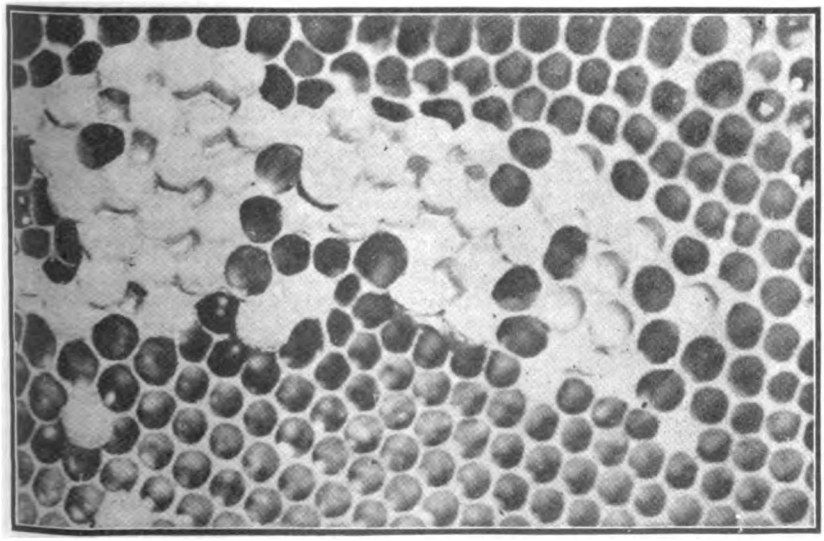
State Apiarist, Kansas State Agricultural College

DURING the last week of May and the first two weeks in June, the variegated cutworms appeared in Kansas in such large numbers that they took upon themselves the habits of the army worm, in fact, they were commonly called army worms. They devastated a large acreage of corn and alfalfa throughout the State, doing an enormous amount of damage. The parasitic tachinid flies took advantage of this sudden abundance of food and proceeded to parasitize these worms, very heavily. By so doing they proved themselves to be a friend to the farmer. But they began to emerge from the cut-worms just as the white sweet clover was coming into bloom. It was a very favorable spring, in Kansas, for the production of nectar-yielding flowers, and all of the beekeepers over the State were looking forward to a very successful season.

After leaving the cut-worms, the tachinid flies immediately proceeded to take on the habits of bees, and spent most of their time gathering nectar. Counts were made of patches of sweet clover, over various parts of the State, i order to find out the relative proportion of the tachinid fly to bees in the sweet clover. These counts show a range in proportion from six flies to one bee up to as high as forty flies to one bee, and very often it would be noticed that a bee would come to a patch of sweet clover on which the flies were busily at work, and then, on finding the flies there, would leave almost at once, having secured no nectar. In several cases the length of time that it took a bee to gather a load of nectar was recorded, and it was found that it required twenty-three and one-half minutes for a bee to secure enough nectar to start back to its hive. The number of heads of white clover which each bee would visit before it had gathered a sufficient amount varied, but in some instances they visited as high as 110 blossoms before completing their load. The result of this has been that, even though the beekeepers had strong colonies, the presence of the fly so reduced the supply of nectar that the most the bees could do was to secure enough to continue brood-rearing. Practically no honey, though, was stored in the supers. The bees were very reluctant to draw out the combs. Early in July the drones were driven from the hives, seriously interfering with queen-rearing. When the flies were caught and examined, their stomachs were found to be filled with nectar.

While this fly has proved to me a great blessing in ridding the fields of the cut-worms, it has very seriously affected the amount of honey that would be stored from the summer plants in Kansas.

Manhattan, Kans.



Stretched cells filled with drone brood as a result of sagging combs. This emphasizes the importance of careful wiring of frames when putting in foundation.

Hares and Bees

By A. F. Bonney

WHILE in Fort Dodge recently, after attending a meeting of beekeepers in Ames, I called on an old-time friend, Mr. E. E. Townsend, who, as most Iowans know, is a progressive and enthusiastic beekeeper, and I found him with the Belgian hare fever well developed, and he did not do a thing but inoculate me.

Seeing him at his home in the suburbs of Fort Dodge with his rabbits, chickens and bees gave me an insight into what an energetic man can accomplish, if his heart is in his work. Mr. Townsend has, I think, between 200 and 300 colonies of bees, great numbers of prize-winning Plymouth Rock Chickens, and now the hares. Incidentally, he has one of the nicest wives a man ever raised and seems to appreciate the fact. These good people are in their early old age, and filled with ambition and vigor.

But about hares: What Mr. Townsend showed me set my alleged brain to working, namely a big brooder-house of baby Plymouth Rocks which would average about 12 ounces in weight. Next some fine Belgian hares which weighed a matter of 4 pounds each. The chicks were hatched the same day the hares were born, but it had cost a cent an ounce to raise the chickens, and about a cent a pound to raise the hares. A ratio of 16 to 1, "without asking the consent of any other nation on earth."

Mrs. Townsend, when she learned that I know how to cook, said:

"It is largely in the cooking, Doctor," meaning the palatability of the hare meat. "I," she went on, "soak the meat over night in salty water, then put it on to cook in water containing a piece of salt pork; let this water boil away, and finish by frying in the pork grease." I ate a meal with my friends and can testify that Mrs. Townsend also knows how to cook.

I intend to begin this summer with hares, as Mr. Townsend has offered to let me have a pair of registered animals at a fair price, and I am only waiting until he has them ready to ship, and as others besides myself may want to commence with them, I will state that in my opinion they will go well with bees. They do not require 5 per cent of the time chickens do, take vastly less room, do not scratch up the garden, are cleanly and prolific and the meat, if properly cooked, is as good as that of chickens. There is a good demand for them, which can be increased by advertising, and this can be done on the same slip your honey is told about. As to feed, a bale of hay and a bushel of oats, with now and then a carrot or some cabbage leaves will keep a hare all winter, while in the summer one can cut grass and clover for them. Compare this with feeding a chicken.

Year-old chickens are worth now, at retail, 25 to 40 cents a pound. A person could sell hares at 10 cents

a pound and make more money than the farmer does on his chickens.

A box 36 to 40 inches square and 24 inches deep, with a tight cover, of shingles or tar paper, a door about 18 inches square, covered with strong screen wire 4 to 6 meshes to the inch, and an inner box 16 inches square for the hare to stay in, are all that is needed, except that this box should be set two feet or more from the ground. There are books published which give detailed information regarding breeding, color of prize stock, markets, etc., which can be purchased at nominal prices, and these may be consulted. This article is not intended to be scientific, but to serve as a hint.

Buck Grove, Iowa.

DR. MILLER'S ANSWERS

Send Questions either to the office of the American Bee Journal or direct to
DR. C. C. MILLER, MARENGO, ILL.
He does NOT answer beekeeping questions by mail.

Queens

1. What is the average capacity of all your Italian queens, as near as you can tell offhand, expressed in number of frames of brood in height of season?

2. What should the brood-frame capacity of a breeding queen be? Of course this implies that she has all other desirable traits.

3. How soon is it *possible* for a virgin to fly after hatching? That is, if she is not the first one to hatch at swarming time.

4. In your experience, what was the age of the youngest virgin that ever led off the first, secondary or afterswarm in a given colony?

MICHIGAN.

ANSWERS.—1. Seven or eight frames, the brood-chamber containing only eight frames during the harvest. Earlier they occupy more.

2. Maybe 15 frames.

3. If she is not the first one she is likely to be able to fly the minute she gets out of the cell. Indeed, she may be able to fly before that, since any virgin after the first is likely to be held in her cell for some time.

4. I don't know. My experience in that regard is exceedingly limited, having scarcely ever had an afterswarm.

Shade Boards

Could you give me some idea of how to make a hive-stand wit' a cover to keep off the rays of the sun? WISCONSIN.

ANSWER.—You can shade your bees by a cover made on the shed-roof plan. Take a piece of stuff long enough to reach from the east to the west side of the hive-cover—this piece to rest on the hive-cover at the north side—and on this piece nail the ends of shingles or cheap boards such as you may obtain from broken-up boxes. It will be better if the shingles or thin boards project at the south side so as partly to shade the south side of the hive. Put a stone on top to prevent the wind from blowing it away. Or, you can do another way if you have some long grass at your disposal. Mow the grass and put a small armful on the top of the hive, weighing it down with one or two sticks of stovewood.

Wintering—Feeding

1. I am trying to find out the best way to winter bees on their summer stands. I read in a journal, to place a hive on the bottom-board, filled with empty frames, an inner cover on top, with 2 holes bored in front for ventilation, then the hive of bees set on that, with a tray on top filled with dry leaves. My idea is to drive four stakes at the corners to make a space of about 5 inches all around and fill it with dry leaves, holding this down with paper, tacked, but leaving the entrance open in front; or would you winter in one hive with tar paper around the same?

2. Is it best to feed in open, or feed in the hive, or in what manner? Will it do to feed them all they will take? NEBRASKA.

ANSWERS.—1. The plan you outline ought to bring good results, provided outdoor wintering in your region is best.

2. Your bee-books should give you full instruction about feeding. and this department is not to take the place of books, but to supplement them. Feeding in the open is a little more like the natural gathering from the field, and on that account is to be preferred if there are no bees from other apiaries to share with your own bees. It may be all right to feed the bees all they will take, and it may not. Sometimes they will continue taking feed until the combs are so full that there will not be room for the queen the following spring. But there isn't much danger of that unless more than 40 pounds of honey and syrup are in the hive. It will be better if the bees have stored enough honey so no sugar need be fed. If you have a good cellar it may be that your bees would do better in it than outdoors.

Laying Workers

Can you explain the presence of laying workers in the super of a queenright colony?

On August 6 I killed the old queen of one of my colonies, and at the same time introduced a new queen in a mailing cage. August 17, I inspected the hive and could not find the new queen. There were no eggs nor young brood, but there was one ripe queen-cell. I then inspected the super to see if the queen could have squeezed through the excluder. I found drone-brood at all stages in both drone and worker cells. Also many dwarfed drones, which indicated that the laying workers were present before the old queen was disposed of.

I suppose the laying workers were the cause of the bees not accepting the new queen.

There was no sign of laying workers in the brood-chamber.

DISTRICT COLUMBIA.

ANSWER.—This seems exceptional beyond precedent, and I haven't the remotest idea why it happened.

Caging Queens—Equalizing Weaklings

I save all possible bees to rear brood for the clover flow, then double up all the weaker ones with stronger ones, then remove all queens and form nuclei. This way there will be no new larvæ to eat up the surplus until they rear a new queen, which will take them safely beyond the honey-flow. I notice some suggest caging the old queen for this same purpose, until the honey-flow is over.

1. Would the bees work as well while forming a new queen as they would if the old queen was caged in the same hive with them?

2. When you double up a weak swarm with another in the same apiary, will not the bees go back to their old stand?

3. Do you, in all cases, prefer "leaving it to the bees"?

4. Which covering for frames do you consider the best, burlap, ducking or oil cloth?

5. How about equalizing weaker swarms and nuclei by giving frames of brood from stronger ones—is it advisable? OHIO.

ANSWERS.—1. My guess would be that the bees would work as well while rearing a new queen as they would with an old queen caged.

2. Yes, with no precautions the field bees are apt to return to their old location. This can be partly or wholly prevented by using the newspaper plan for uniting. Put a sheet of common newspaper over one hive, and over this set the other hive. The bees in the upper hive cannot get out until a passage way is gnawed in the paper, and by that time they are reconciled to remain in the new place.

3. By no means would I always leave everything to the bees. Indeed success depends chiefly on knowing just what to leave to the bees, and how to interfere with their notions. To leave everything to the bees would spell practical failure, for much of their strength would be dissipated in swarming instead of gathering

4. Hard to say; but for many years I have preferred to have neither, merely having an air-space between the top-bars and the board cover.

5. It may be advisable, provided all can be brought up to good strength for winter.

Pasturage

1. I am a beginner and have ten colonies of Italian bees that will go in winter quarters strong. I live in a little town and am the only man who keeps bees here. I would like to have about one hundred colonies or more, and am quite sure there is not enough nectar right here to make beekeeping a paying proposition, but about one and a half miles from here there begins a swamp full of vines, lilies and other honey-producing plants. Do you think my bees would go to that swamp, and that it would be a paying proposition to have one hundred colonies here?

2. Is the water lily a good honey-producing plant?

LOUISIANA.

ANSWERS.—1. You've picked out one of the hardest questions in beekeeping. In the first place, I'm hardly ready to take your word for it that 100 colonies could not find enough to do at your home, without going as far as a mile and a half away, although the probability is that you are right. In the second place, it's such a hard thing to find out that you will probably never know to a certainty if you keep bees for a hundred years. One year you may get a good crop with 100 colonies, and yet you cannot be certain whether you would have had more surplus with 90 or 110 colonies. Seasons change so that 100 colonies might do well one year, and 50 starve the next year. So no one can tell what number on the average would be profitable. But I should feel safe in saying that your bees will work almost or quite as well on pasturage a mile and a half away as on the same field half a mile away, and it is quite possible that 100 would be none too many in your home apiary.

2. I don't know. It is very fragrant, but I've never heard of honey in quantity being secured from it.

Foulbrood—Queens—Moths

1. What is foulbrood?

2. What is meant by a virgin queen?

3. In what way are queens changed, and what effect does it have on the workers?

4. Can comb be used more than one year in succession if thoroughly cleaned?

5. In what way can moths be avoided? In what way may they be prevented?

WISCONSIN.

ANSWERS.—1. Foulbrood is a germ disease that attacks bees in the larval state. If it slips in on you without your knowing what it is or how to handle it—good night. Better get a good bee-book that tells about it, or write to Dr. E. F. Phillips, U. S. Department of Agriculture, Washington, D. C., and ask for free literature about foulbrood and its treatment.

2. A young queen that has not yet mated with a drone.

3. The queen present in a colony may be removed or killed, and another introduced through an introducing cage. The effect on

the workers will be an utter change in something like nine weeks, the progeny of the old queen dying off in that time, if it is in the working season, and all the workers in the hive being the progeny of the new queen.

4. Yes, a comb in the brood-chamber or in an extracting super may be used 20 years or more without cleaning, except that extracting combs should have all the honey cleaned out of them each fall by the bees.

5. I don't know how you can entirely avoid having any moths except by keeping no bees. You can prevent their doing any great harm by keeping colonies strong and of Italian stock.

Bee Tree—Hiving Swarms

1. If I find a bee tree in the woods, do I have to get permission from the owner to cut it down?

2. A neighbor near us had a swarm of bees come out this year. He hived them five or six times but they came out and lit on a tree; so he gave them to a man who was working there who hived them and they stayed. What was the reason they wouldn't stay in the first hive?

3. What is the most profitable, comb or extracted honey? IOWA.

ANSWERS.—1. Yes.

2. No telling for certain, but the probability is that it was too hot for the bees. A newly-hived swarm should be shaded by some means and have abundant ventilation, perhaps by raising the cover half an inch or more and raising the hive on blocks.

3. In some localities one, and in some localities the other. Even in the same locality it is not always alike. Last year extracted was more profitable in many a locality where comb honey had previously paid better.

Peculiar Behavior of Bees

I have 10 colonies and two of them seem to have a funny habit. They are this year's swarms and have their hive-body full of honey and brood. The supers have sections with full sheets of foundation in them. There are lots of bees in the supers, but they don't seem to work very fast. I am sure there is plenty of honey in the fields. What I can't understand is why quite a few bees sit around on the platform, or alighting board in the daytime, and act as they were trying to cut, or bite the paint or wood. They will lean as far forward as they can and then back without going off their hind feet. All the while they will have their two front feet going back and forth. What do they think they are doing? MICHIGAN.

ANSWER.—The probability is that your bees are all right. If the brood-chamber is full of brood and honey they certainly have been gathering, and if later they have been doing little in supers it may be there is little in the field for them to do. The fact that flowers are in bloom is not proof that nectar is plentiful, for sometimes the bloom will be plentiful yet yielding no nectar. Their funny actions in moving back and forth at the entrance is called "raking." I don't know why they do it, and never saw any satisfactory explanation for it. But if you are observing you will see it every year at almost any hive.

Transferring—Location

1. I have ten hives of bees; five are in old-fashioned home-made hives. Two of the five have movable frames. The other five are in new hives in which full sheets of foundation were used. I would like to get the bees out of these old hives and by next fall increase to 20. Of course I want to get all the honey I can. I have no comb built out but would use foundation. I don't like to transfer by cutting the combs out of the old frames and fitting them in the new. I would make the increase artificially and would buy laying queens.

2. In "Forty Years Among the Bees" you say that if you were starting over again you would hunt some time to find a place where they had two flows—summer and fall flows. If a young man is intending to make beekeeping his sole occupation, would you advise leaving Wisconsin and hunting for a better place? The last two years have been very poor here in Southern Wisconsin.

ANSWERS.—1. As you want to avoid patching combs and as the swarming season is now past, perhaps your best way will be to wait till next pear. Then, when a colony swarms, hive it in a movable-comb hive, setting it on the old stand with the old hive close beside it. A week later move the old hive to a new stand. Two weks later still, or three weeks after swarming, there should be in the old hive only a little quite young brood, when you can chop up the old hive, melt up the combs, and brush the bees into the other hive, or else brush them onto frames of foundation in a new hive.

2. If you are in an average Wisconsin location it is somewhat doubtful whether it would be advisable to leave the State. At any rate, better not make any move until you have personally visited the new location, whether it be five miles away or a thousand, and are thoroughly satisfied the move will be advantageous. Some have left Wisconsin for what they supposed a better location, and then have gone back and settled contended in the old home.

Profit From Bees

1. You say that $5 profit is all that can be made out of a hive of bees, and 100 colonies is all one man could keep, so it seems that one could only make $500 a year, with chance for a failure in a bad season. I thought one might be able to keep 600 colonies and have about $10 on a hive. I thought of taking up beekeeping as a business, but if such as you say I want nothing to do with it.

2. What hours of the day do you work with your bees?

3. What was the amount of the Dadants' crop for 1918?

4. What was your highest average crop and your lowest, per colony?

5. Do you think beekeeping would pay for a man with a large family, when food prices are now so high? ILLINOIS.

ANSWERS.—1. I have no recollection of having made such an unqualified statement, and if you'll give the place where I made it I'll be ready to reply.

2. If only a little is to be done, the middle of the forenoon is a good time; but when there is enough to do I work from daylight till dark or after dark.

3. The Dadant crop was short in 1918.

4. My highest average was an apiary of 72 colonies; 266 sections per colony (244 pounds.) My lowest was years ago, when the yield was an utter failure and I had to feed for winter.

5. Men have succeeded, and probably will again succeed, in making enough from bees to take care of a large family. To be sure, everything is high now, but so is honey. The man, however, who makes a success at beekeeping is not so likely to be the man who says he will have nothing to do with it unless assured a certain amount, as the man who cannot be pried away from his bees even if he thinks he will keep them at a loss. The successful beekeeper is the one whose whole soul is in the business.

(There are several beekeepers who made as much as $20,000 in 1918.—F. C. P.)

Deserting Bees

1. The latter part of July I noticed nearly all the bees of one hive were clustered on the outside, and there was honey dripping out, so I raised the top a little to give more air. A few days later I investigated and found the hive deserted. The super was nearly filled with honey and there was ample stores below, but none of it capped. The honey had a slightly sour smell, was thin and foamy. Each cell was overflowing with this foam like a can of fruit that had spoiled. They had an abundance of sealed brood, but no eggs nor larvæ, and the moths had made considerable progress in the brood-nest. This was my best swarm of bees; it was extra strong. Now I would be glad if you would tell me what was the trouble, and why did a strong swarm of bees let the moths come in?

2. Are the bees clustered on the outside of the hive working bees or are they young bees?

3. Do bees sleep? TEXAS.

ANSWERS.—1. I don't know what the trouble was, but I suspect that one part of the trouble was in the character of the honey. I have read of cases in which the honey worked as yours did, presumably because of the honey from certain plants or decayed fruits; but I don't know what the plants were. Perhaps another trouble was queenlessness, the moths coming in after the colony had dwindled away.

2. They may be of any age, older bees predominating.

3. I have read that they do.

Cellar Wintering

1. How large a space is used over the frames when wintering in the cellar?

2. What is used to keep the bees in the hive while they are being put in the cellar?

3. When is the best time to put them in?

4. Would a super filled with leaves on a hive in the cellar make them restless? If so, why? WISCONSIN.

ANSWERS.—1. Probably not all the same. In my own hives the space between top-bars and cover is the same as on the summer stands—about one-quarter of an inch.

2. Nothing. The bees are supposed to be so quiet and so quietly handled that they do not come out of the hives to any extent. If, however, it is desired to fasten them in the hive, a large cloth, dripping wet, may close the entrance.

3. If you can guess nearly enough as to what the weather will be, take them in the next day after their last flight. In Wisconsin that is likely to be in December, or very late in November.

4. It would not be likely to make them restless.

Black Drones

I have an extra good colony of bees. Workers are all bright, evenly-marked Italians, not a black bee in the hive, *but*—what I want is advice. Some of the drones are as black as coal. Would you advise breeding from this queen? It is about the best colony I have in a yard of forty. I would like to rear some young queens from it if it was not for those black drones. TEXAS.

ANSWER.—Don't worry about those drones. Either drones or queens of Italians may be very dark; but if the workers are all right they are counted pure.

New York Field Meet

Nearly 750 New York beekeepers gathered at the farm apiary of Deroy Taylor, Newark, August 1, where they listened to nationally known speakers and witnessed demonstrations in handling foulbrood. Prices for honey were recommended by a State committee headed by S. D. House. Speakers were: O. L. Hershiser, Kennith Hawkins, G. C. Porter, State Marketing Bureau, E. R. Root and George H. Ray. Mr. Hershiser was chairman, Mr. Hawkins spoke on fall management, Mr. Root on California disease conditions, and Mr. Ray on his extension work in the State. Co-operative marketing of honey was considered by members after Mr. Porter's talk. A picnic luncheon was a feature of the day. A winter meeting of the Association is to be held later.

New Jersey Beekeeping

The "Proceedings of the New Jersey Beekeepers' Association" for 1918 and 1919 is before us. It would be difficult to put more useful and interesting information in 40 pages than there is in this neat pamphlet, which does not bear the name of the man who compiled its contents or looked after the execution of the work. It contains about 20 addresses, all, or nearly all, by competent men who have something to say. It can probably be secured by addressing E. G. Carr, New Egypt, N. J.

A Good Report for Caucasian and Carniolan Bees

The honey crop of this section is very short and of poor quality. There has been more disease among bees than usual, too.

Am receiving $6 for 24-pound case of honey and could get more if I asked it.

Extracted honey is selling for 25 cents per pound.

The largest crops of comb honey are from the beekeepers that had the Caucasian and Carniolan bees, while the ones having Italians and hybrids are reporting small crops.

A good fall flow is expected.

W. W. LANTIS,
Perry, Mich.

Bee Laws of Florida

The Bee Disease Act, approved June 9, 1919, vests in the State Plant Board of Florida the authority to enforce the law and also to make such rules and regulations having the force and effect of law as may be necessary for carrying out the provisions of the act itself.

Among other things, the new law prohibits the shipment into Florida of honeybees unless in combless packages unless they are accompanied by an official certificate of inspection of the State Apiary Inspector or State Entomologist of the State or country from which shipped. This provision of the law will be rigidly enforced, as the Plant Board has a very effective quarantine system and has quarantine inspectors so located that practically every express, freight and water shipment entering Florida comes under the eye of one or more inspectors. It is therefore practically an impossibility for bees to be shipped into this State without a certificate of inspection attached without their being detected by our inspector. There have been similar laws in other States, and sometimes the beekeepers have not taken them seriously. However, Florida is comparatively free from infectious diseases of bees, and the present law is going to be enforced to the letter. It is the desire of the State Plant Board of Florida to co-operate with beekeepers everywhere and at all times for everything looking to the betterment of the beekeeping industry. However, the doors of Florida are no longer wide open for the entry of diseased bees from Northern States, and beekeepers who undertake to ship their bees into Florida without a certificate of inspection attached will soon find that the law is being enforced.

WILMON NEWELL,
Plant Commisioner.

Maryland State Beekeepers' Association

A very successful field meeting of the Maryland State Beekeepers' Association was held at the home and apiary of Mr. Walter E. Atkinson, of Glyndon, Md., July 26. Forty-five members were in attendance. The meeting was addressed by Mr. L. H. Vanwormer, of College Park, Md.; Mr. Sam Cushman, of Baltimore, Md., formerly a Rhode Island beekeeper; President, Dr. J. R. Abercrombie, of Baltimore, Md., and by County Agent J. F. Hudson, of Baltimore County. Those present had the opportunity of seeing an apiary of forty-five colonies kept in double-walled hives, and observing Mr. Atkinson's methods of producing both comb and extracted honey, as well as the complete and extensive honey-house and appliances. Definite steps were taken towards the co-operative buying of bee supplies. The Association voted to purchase its supplies co-operatively, and the purchase of approximately $2,000 worth of supplies was secured at the meeting.

In addition to the business part of the session, Mrs. Atkinson furnished most acceptable and delightful refreshments at the close of the field meeting. ERNEST N. CORY,
Sec.-Treas.

Annual Meeting

The annual meeting of the Northern Illinois and Southern Wisconsin Beekeepers' Association will be held in Memorial Hall, in Rockford, Ill., on Tuesday, October 21, 1919. All interested in bees are invited to attend. B. KENNEDY, Sec.

Mississippi Bees Buzzing

County Agents of Mississippi to the number of 250 gathered at the Agricultural College in annual meeting, pledged themselves to boost beekeeping, after hearing Kennith Hawkins, of the G. B. Lewis Company explain the advantages of beekeeping in boll weevil districts. R. L. Wilson, of the Extension Division of the State University, also talked to the agents and a demonstration exhibit of bee supplies was shown at the meeting. A number of bee clubs have been formed in the State and several County Agents are already aiding beekeepers in marketing co-operatively. Ten counties will have a club bee exhibit at fairs this fall.

East Tennessee Meet

The first meeting of the newly organized East Tennessee Beekeepers' Association was held July 29 at the apiary of Curd Walker, Jellico. The attendance was excellent and the weather ideal, which permitted demonstrations in transferring, queen-rearing and extracting, which are destined to bring about great results. In the afternoon the program was devoted to a round table of questions and answers, led by the President of the Association, Prof. G. M. Bentley, Entomologist, University of Tennessee, Knoxville. Another field meet is to be held this fall.

Cayuga County Beekeepers Meet

The Cayuga County Beekeepers' Society held a basket picnic at the home of Mr. and Mrs. Geo. L. Ferris, of Five Corners, N. Y., on Tuesday, August 26, 1919. Between 60 and 70 beekeepers attended the picnic, which was made interesting by the presence of Prof. Rea, of the New York State College of Agriculture, Ithaca, N. Y., and Mr. C. E. Wetherby, Manager Cayuga County Farm Bureau, the former speaking principally upon brood diseases and their treatment, the latter dwelling mainly upon formulating plans for county extension work for the coming year. A pleasant time was enjoyed by all.

F. D. LAMKIN, Sec.

High Priced Honey

When Detective Britton was killed in the performance of his duty at Sioux City, Iowa, recently, the Tribune started a subscription for his family. Dr. Bonney sent a gallon can of honey, which was sold at auction for $150 to swell the fund. It seems that the purchaser donated the honey to the Boys and Girls Home, so that, as Manager Kelly of the Tribune says, "Honey rarely ever sold so high, nor served so many people."

Advance of Prices

O. L. Hershiser called attention to the fact at the New York field meeting, that bee supplies have not advanced as much as other goods. Some beekeepers are inclined to think that bee supplies have adadvanced unreasonably in price and more in proportion than most other articles. The following comparison of other articles, with the per cent of increase based on the prices of each in 1913 and in 1919, are interesting: Wheat, 166 per cent; hogs, 123 per cent; sugar, 107 per cent; coal, 82 per cent; cotton yarns, 81 per cent; leather, 74 per cent; petroleum, 63 per cent; forest products (including beehives), 49 per cent; illuminating oil, 47 per cent; coffee, Rio, 44 per cent; lead, pig, 19 per cent. These figures are accurate and authoritative, having been furnished the parties interested by the Federal Reserve Board under date of May 1, 1919. K. H.

Mr. Kindig's Work

The "Beekeepers' Letters" by B. F. Kindig, published by the Department of Entomology of the Michigan Agricultural College, are worthy of commendation. We have before us No. 7, published in August. It is a 5-page letter and full of good things. Mr. Kindig is a worker. Beekeepers of Michigan should secure all that he writes.

Bartholomew to Florida

C. E. Bartholomew, formerly of the Iowa Agricultural College, and later a member of the field force of the Bureau of Entomology, has been appointed assistant to the Plant Commissioner of Florida, in Bee Disease Control, with headquarters at Gainsville.

New Law in Wisconsin

Wisconsin has a new law for disease control. One of the provisions prohibits the sale or removel of bees or equipment without a permit from the Inspector of Apiaries. It thus becomes impossible for Wisconsin beekeepers, even though no disease is present, to ship any old combs or used equipment without such permit. We would caution beekeepers to comply with the law and thus avoid possible trouble. A strict interpretation of the law would prevent the beekeeper from moving an apiary from one location to another without first communicating with the inspector. Wisconsin beekeepers will do well to write to the State Entomologist at Madison and get his interpretation of the law on this point.

Pasting Labels on Tin

A good way is by the use of Turlington's Balsam, otherwise tincture of benzoin compound. Daub tin to be covered with label with a little of the tincture, allow it to dry, and label will stick to it ever after. The writer used it for a good many years and it worked.

NAHMAN ROSENSWEET,
Arden, Dela.

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Advertisements in this department will be inserted for three cents per word, with no discounts. No classified advertisement accepted for less than 35 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 20th of the month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

BEES AND QUEENS

FINEST THREE-BANDED Italian queens for $1.25, 6 for $7. J. W. Romberger, Apiarist, 3112 Locust St., St. Joseph, Mo.

FOR SALE—120 colonies of golden and 3-band Italian bees, complete queen-rearing and mating outfit; enough customers for the output of three hundred hive apiary; good honey country; good location. Price, terms and details a matter of correspondence. Address, J. W., care American Bee Journal.

THE AMERICAN BEE JOURNAL is prepared to furnish printing for beekeepers. High quality, prompt service and satisfaction. Our shop is in charge of a man who specializes in printing for the honey producer. Send for our catalog of honey labels, stationery, etc. American Bee Journal, Hamilton, Ill.

FOR SALE—300 colonies of bees, all in first-class condition for winter, with ample stores, in new Woodman Protection hives; no disease; must be sold by November 1. Reason for selling, age and poor health. Write for particulars. Bell E. Berryman,
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QUEENS AND BEES—This fall is proper time to replace all queens 2 years old, as well as the failing ones. Circular free. See large add elsewhere.
Nueces County Apiaries,
E. B. Ault, Prop., Calallen, Texas.

FOR SALE—Italian queens, from best disease-resisting stock, mailed as soon as hatched. Directions fo introducing with every order. Price, April to October, in large or small lots, 60c each. James McKee, Riverside, Calif.

FOR SALE—100 colonies of bees, most all in new hives with Hoffman frames. Plenty of stores. Address James Johnson,
Box 265, Pocahontas, Ark.

FOR SALE—Leather colored Italian queens, tested, June 1, $1.50; untested, $1.25; $13 a dozen. A. W. Yates,
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THREE-BANDED ITALIANS ONLY—Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. H. G. Dunn,
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PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you desire. They are great honey gatherers, beautiful and gentle. Virgin, $1; mated, $2. C. W. Phelps & Son,
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GOLDENS that are true to name. Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. Garden City Apiaries,
San Jose, Calif.

LEATHER and all dark colored Italian queens, when we have them, mated, $1 each. These queens will include all that are not up to the standard in our goldens, but will be good utility stock. C. W Phelps & Son,
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FOR SALE—Pure 3-banded Italian queens, as good as you can buy with money, from June 1 to September 1.
J. F. Diemer, Liberty, Mo.

BEES AND QUEENS from my New Jersey apiary. J. H. M. Cook,
1Atf 84 Cortland St., New York City.

FOR SALE—Three-banded Italian queens; untested queen $1, six, $5.50; twelve, $10. Tested queens $2 each.
Robert B. Spicer, Wharton, N. J.

FOR SALE—Golden queens second to none, for honey gathering and gentleness are unsurpassed; untested $2, tested $5 to $10.
E. V. Marston, Roxbury, Va.

FOR SALE—J. B Brockwell's golden queens, untested $12 per doz., $7 for 6, $1.50 each; 3-frame nuclei $8, with queen. Tested queens $3 each. J. B. Brockwell, Barnetts, Va.

"SHE SUITS ME" Italian queens, $1.15 each, from May 15 to October 15; 10 or more, $1 each. Allen Latham, Norwichtown, Conn.

FOR SALE—Baby swarms, three frames and queen, $5. J. A. Dougherty,
Box 66, California, Hamilton Co., Ohio.

FOR SALE—Italian bees and queens (the kind that fill from 2 to 6 supers). Bees, $12 a colony; queens, $2 each, 6 for $11. Queens go by mail, bees by express. Order direct from this ad. Miss Lulu Goodwin,
Mankato, Minn.

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FOR SALE—Choice clover and buckwheat honey in 60-lb. cans, 2 in case; also 2 160-lb. kegs. Clover honey, 25c; 20c for buckwheat, f. o. b., cash with order. Large sample, 15c to apply on order.
Edw. A. Reddout, Lysander, N. Y.

FOR SALE—Extracted clover and buckwheat honey. Let us quote you.
The Forest Honey Co.,
2333 S. Woodstock St., Philadelphia, Pa.

WANTED—White clover or light extracted honey. Send sample; state how honey is put up and lowest cash price delivered at Monroe; also buy beeswax.
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WANTED—Comb and extracted honey; send sample of extracted and quote your best wholesale price f. o. b. your station, how packed, etc., in first letter. D. A. Davis,
216 Greenwood, Birmingham, Mich.

WE BUY HONEY AND BEESWAX—Give us your best price delivered New York. On comb honey state quantity, quality, size, weight per section and sections to a case. Extracted honey, quantity, quality, how packed, and send samples. Chas. Israel Bros. Co.,
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FOR SALE—5,000 pounds clover extracted honey, new crop, two 60-lb. cans to case, 25c per pound. J. P. Goodwin,
South Sioux City, Neb.

WANTED—Honey, in light and amber grades. Send sample, stating quantity, how put up, and lowest cash price delivered in Spring Valley. Ed. Swenson, Spring Valley, Minn.

FOR SALE—15,000 pounds of fine clover and basswood honey. The best offer takes it if satisfactory. Chester E. Keister, Clarno, Wis.

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WANTED—Comb, extracted honey and beeswax. R. A. Burnett & Co.,
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GOLDEN DAWN APIARIES for sale, with or without location; 140 colonies; 95 per cent up-to-date hives, painted 2 and 3 times. Combs drawn on full sheets foundation and wired; 8 and 10-frame. Also quantity drawn comb, about 100 extra 10-frame hives with full sheets foundation wired (new). Some shallow extracting supers with comb and foundation (also new), and 350 section supers, mostly new. A good, clean lot for someone who can use it. Going to the coast and want to dispose of the above in the next thirty days.
Golden Dawn Apiaries, Yankton, S. D.

FOR SALE—Ten 10-frame Protection hives, complete, each $3; 10 empty standard hives, each $1; 30 plain-section supers complete, each $1. M. Ullmann,
Box 395, Highland Park, Ill.

FOR SALE——200 new 10-frame cross style, reversible bottom-boards t 50 cents each; 200 new flat reversible covers at 60 cents each; 5,000 all-wood extracting frames at $5 per 100; 100 new Alexander feeders at 20 cents each; 150 Boardman feeders without cap or jar, at 12 cents each. All above goods are factory made and have never been used. I also have some 8 and 10-frame hives complete which space does not permit to mention here. Write M. E. Eggers, Eau Claire, Wis.

FOR SALE—My 5-acre piece of land, with modern 8-room house, good barn, chicken coop, bee house and woodshed; all in good condition. Reason for selling, going on a farm. Address Theo. L. Thompson,
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Siberian Fur Farm, Hamilton, Canada.

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FOR SALE—Photos of L. L. Langstroth, inventor of movable-frame hives, size 7x9; price, $1. American Bee Journal,
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FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
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WANTED

WANTED—Bees in Jumbo hives; also Jumbo frames with drawn combs. E. A. Newman, 4205 Eighth St., Washington, D. C.

WANTED—Comb and extracted honey, light and amber and clover grades.
Robert Gilkinson,
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WANTED—Man for comb-honey production; 12 months' work. State wages expected and experience. Sunnyside Apiaries,
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WANTED—Position with bee supply manufacturer or southern or California bee specialist, by technical graduate of Toronto University, 29 years of age, married, 2 years' experience in practical beekeeping and the manufacture of beekeepers' supplies. Address, care of American Bee Journal.

WANTED—Cowan honey extractor. For sale—Winchester shotgun, new, 16-gauge.
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WANTED—Your old combs, cappings or slumgum to render into beeswax by our high steam pressure wax presses.
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MY FEEDER—Make 'em yourself. I tell you how. Won't rust. Sample and tool postpaid, 24c. Dr. Bonney, Buck Grove, Ia.

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SPECIAL—Best No. 1 Sections, per crate of 500, $3.50; other goods in proportion. Price list free. H. S. Duby & Son, St. Anne, Ill.

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WANTED—We have installed a steam process for rendering old combs, cappings and slumgum, and want you to give same a trial. Write us for terms. We pay market price for the wax rendered or will make same into Miller's California Foundation. Send for our catalog.
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ENGLISHMAN, Ex-officer of British army, son of prominent British beekeeper, life-time experience, desires managership of apiary in California. First-class education (diplomas), 22 years of age, strong, virile. Willing to take over next spring. First-class references. Write, stating salary, "P," American Bee Journal office, Hamilton, Ill.

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We will have several thousand for sale this Fall, also booking orders for next year. Send for *Free Circular* giving prices, etc., for Spring delivery. We will guarantee shipments to be made on time; circular explains. September and October is considered the best time for southern beekeepers to requeen.

	1	6	12	50
Untested	$1.25	$6.50	$11.50	$40.00
Select Untested	1.50	7.50	13.50	48.00
Tested	2.00	10.50	18.50	
Select Tested	2.75	15.00	27.00	

One pound package of bees $2.40—25 or more $2.16 ea.
Two pound package of bees 4.25—25 or more 3.83 ea.
Three pound package of bees 6.25—25 or more 5.62 ea.

Prices of regular Nuclei, also Nuclei on ALUMINUM COMBS, given in circular. We have shipped for several seasons thousands of pounds of bees all over the United States and Canada. Add price of Queen when ordering bees.

NUECES COUNTY APIARIES E. B. AULT, Prop. **Calallen, Texas**

Crop and Market Report

Compiled by M. G. Dadant

For our October number we asked the following questions of reporters:

1. How is the final crop, compared to last year, and what is the average per colony?
2. How is honey selling?
3. What price is being offered producers?
4. What price do you expect to realize?

THE FINAL CROP

The crop will be a little short of last year, though conditions have improved since our last report. The main reason for shortage will be the very small crop of white clover locations, and short crops in Wyoming, Utah, and especially in California.

The New England States report from a failure to 75 per cent of last year, while the rest of the East will not run over 75 per cent of the 1918 crop. The same is true of the State of Ohio, while Indiana and Illinois, with eastern Iowa, have practically a complete failure, except where there is a fall flow. Here the crop will be good. Western Iowa and South Dakota report a very good crop, while with Minnesota it is practically a failure. The largest beekeeper there will have an average of 10 lbs. per colony.

Michigan will have about half of last year, while Wisconsin, with a failure last year, will be improved.

Florida and Georgia will equal last year, while the balance of the South will not be nearly as good as in 1918; Texas reports from 150 to 500 per cen more honey than last year. Idaho and Montana are short, while Colorado will about hold its own with 1918. Washington and Oregon will not be up to normal, and the coast, as reported before, will not have more than 50 per cent of 1918.

DEMAND FOR HONEY

It is yet early for the demand to stiffen, but we are inclined to believe that it is better than the average condition for this time of the year as it was before the war. One big jobber states that the demand is getting good from soft drink and other manufacturers who used honey last year and are again forced to do so from the sugar shortage.

PRICES PAID PRODUCERS

One report comes in from the South of an offer of 8 to 10 cents for average extracted. The bulk of the offers, however, are in the neighborhood of 15 cents for amber and 17 to 19 cents for white, with many purchases of white honey at 20 cents. Comb honey would sell readily at $5 per case, and we are surprised to note that one smaller Colorado Association is holding at $5.50 without a buyer, nor do they report buyers at 17½ cents for extracted, but they take a relatively high freight rate. In the markets comb is bringing over $6 per case. West Indian honey is wholesaling for $1.30 to $1.60 per gallon.

PRICES ASKED BY PRODUCERS

One could probably obtain all the honey desired by offering the beekeepers 20 cents for white extracted f. o. b. their station. In fact, white orange is quoted at this with a cent less for white sweet clover f. o. b. California common points. Some little is being offered at 18 cents. The market seems to be stabilizing around 20 cents for best white extracted, and we will be surprised if the price goes much higher, though not a few beekeepers are holding for 25 cents f. o. b. their station.

Texas honey sells for 17 to 19 cents.

One large buyer of honey stated that he was offering 20 cents for white and 17 cents for amber, but that many were asking 25 cents. He stated that at this price he would buy only as fast as needed, since he was afraid of a future decline.

Comb honey prices are too low. With the present price of extracted, comb honey should not sell under $8.50 per case, yet we see no indication on the part of the producer to ask such a price, the highest I have seen being $7.50, and that for sales direct to consumer.

The Montana Association is advising its members to sell at the following prices: Comb honey, wholesale, $6.50 per case, retail $7 per case. Extracte l honey, retail, 5-lbs., $1.35, 10-lbs., $2.65, 60-lbs., at 23½ cents per pound. Jobbing at 25 cents.

They argue that the jobber who has last year's stock left will have established a high price market and will, in time, be ready to buy at the higher price of 25 cents, which he paid last year. We know of one or two jobbers who are unloading their last year's honey at a loss. Yet the market may stiffen to the higher figure.

PAT. JULY 30, 1918

C.O. BRUNO NAILING DEVICE

Made for the Huffman Brood Frames. A combined Nailing, Wiring and Wedge Clamping Device. Has been tried and is guaranteed to do accurate work.

PRICE $7.50

Complete directions for operating are furnished with each device.

Manufactured by C. O. BRUNO
1413 South West Street, Rockford, Illinois

Don't stop advertising.

because honey is high. Make it more in demand, so the price will stay where it is. Little stickers on your letters, papers, etc., will help. Printed as below in bright red.

EAT HONEY
NATURE'S OWN SWEET - AIDS DIGESTION

Price of 1,000 gummed, 85c.
American Bee Journal Hamilton, Illinois

THE E-Z-WAY BEE FEEDER

Will Save Your Time and Save Your Bees and will Satisfy an Old Established Need

A few pounds of sugar syrup will save your weak colonies; they will be worth many dollars to you next season. Don't lose one, when it is so E-Z to feed and save them with the **E-Z-WAY BEE FEEDER.** We send attachments for 3 hives, instructions for using, feeding and making the syrup with each Feeder. The winter will soon be here; don't delay; order at once, at our risk, 30 days' trial; money back if not satisfied. Price $1, or six for $5, postpaid. Remit by money order, cash or stamps, to

THE HOLDEN MFG. CO.
CLARKSBURG, W. VA.

WESTERN BEEKEEPERS!

We handle the finest line of bee supplies. Send for our 68-page catalog. Our prices will interest you.

The Colorado Honey-Producers' Association
1424 Market Street, Denver, Colo.

ATTRACTIVE CLOTHES

Do not make the man, but they add greatly to his appearance.

Just so with your honey. It must have quality, but should have a neat package and an attractive label.

We can furnish the label. In many sizes and shapes suitable to fit any container.

Write for our new price list of honey labels and stationery.

American Bee Journal, Hamilton, Ills.

THE DISCOUNT THAT COUNTS

In ordering your next year's supply, remember we offer a 5% cash discount this month. The opportunity is too good to miss. You can stock up the depleted list better now than any other time.

OUR GUARANTEE Our guarantee means that you get only standard goods. It means that you will be refunded in case you are not satisfied. Our greatest advertisement are the satisfied **Kretchmer** boosters.

WE SAVE YOU FREIGHT Council Bluffs is centrally located so that your order leaves here by the shortest direct route, saving you time and money.

OUR AIM IS SERVICE That is why we ship orders so quickly, and why we welcome inquiries. That's why we pay particular attention to the many Bee-Keeper's problems. Unusual Swarming? Trouble in Requeening? Bees Ready for Winter? How to Winter Them? What and When to Feed? Our specialist will be happy to give your case **particular and individual** attention.

SEND FOR THE CATALOG

MADE RIGHT BEE SUPPLIES QUALITY SERVICE

REMEMBER THE CASH DISCOUNT

Watch this space for interesting developments within the next two months

KRETCHMER MFG. CO., Council Bluffs, Iowa

AMERICAN BEE JOURNAL

VOL. LIX—NO. 11 HAMILTON, ILL., NOVEMBER, 1919 MONTHLY, $1.00 A YEAR

SUCCESS WITH OUTAPARIES

BY M. G. DADANT

WHERE one beekeeper twenty years ago was an outapiarist, probably more than fifty are today. We are apt to lay this to improved methods of beekeeping and to the initiative of the modern beekeeper, who keeps bees for a living, rather than as a side issue. Yet when we look back over the methods of transportation and the difficulties encountered by the successful outapiarist, the wonder is that there were then so many outapiaries. The territory of each apiarist was naturally limited by the distance he was able to travel with a team of horses, and the number of colonies he could keep, by the number he was able to look after with the time at his disposal. Half of the time was used in travel to and from the apiary. The moving of bees was an extraordinary hard job, owing to the danger of stings, with horses, and the long time needed on the road, and hours were long under almost any conditions.

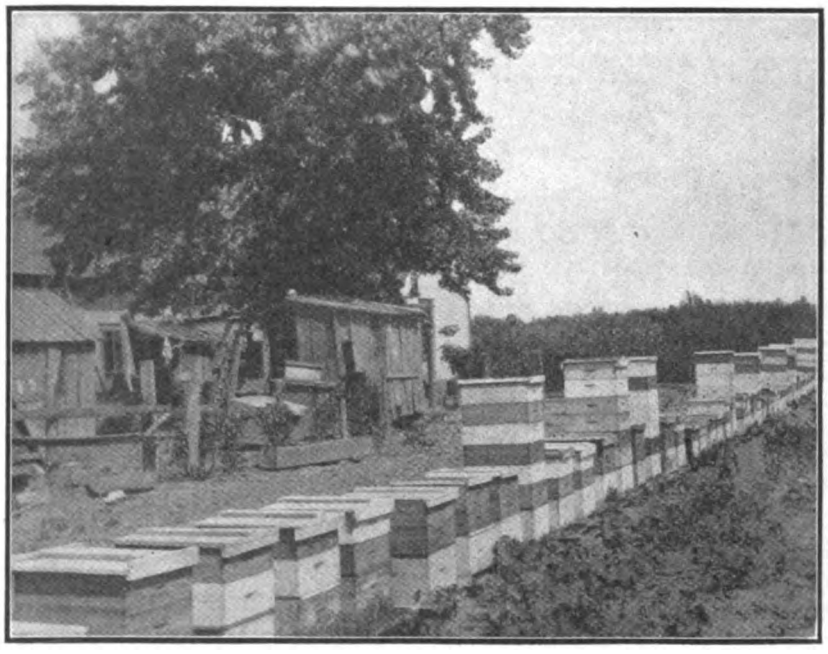
Well do I remember one of my first trips at turning the extractor at one of our outapiaries about twenty years ago. This apiary was only about 5 miles from home, but we were extracting during a dearth of honey, and we were, moreover, using a temporarily vacated dining room of the farmer's house for extracting. This necessitated replacing the supers on the hives at nearly dark. I had gone to the outapiary with our man and the team. By the time extracting was done and the supers returned to the hive, it was after 9 o'clock and the rain had started falling. We still had our wagon to load and the five-mile trip home. Before we had traveled half the distance, the rain was falling in torrents, and by the time we reached the home place we were drenched, and it was nearing midnight. Naturally, my mind did not turn to the possibility of ever having access to territory fifty or more miles away, nor the possibilities of moving bees such a distance to catch an extra crop, and I rather leaned (that evening at least), towards less bees and all kept in the home apiary.

There are several things necessary to make a successful outapiarist, and foremost of these, of course, is a thorough knowledge of beekeeping practice. Necessary as it is to be a beekeeper, rather than a keeper of beehives, for success in the home apiary, it is doubly so for the outapiarist.

He must know what is necessary at the outapiaries at all seasons of the year. In winter, the entrances may become clogged with ice if bees are wintered out-of-doors, or the temperature may be variable in the cellar.

If improperly put into winter quarters there may be spring dwindling. Early examinations will have to be made in the spring to close up dead colonies, and contract the entrances of the weaker ones. When weather permits, more minute examinations of each colony for queens, food store, and disease, will have to be made. Drone-laying colonies and queenless ones should be united to strong colonies, and winter packing removed.

As the crop approaches, the bees should be prepared for it, so as to have a maximum producing force ready for the crop when it arrives. Supering should be done at the right



An outyard in Mississippi river bottoms, property of E. A. Welch, Quincy, Ill.

time to hold down swarming, and entrances of hives should be enlarged according to their strength. The outapiarist must endeavor to allay the swarming impulse, since in the outapiary a larger percentage of swarms would be lost. He must remember, and put into practice, the fundamentals in swarm prevention—young queens, ample breeding and storing room, sufficient ventilation, absence of drone comb.

With the crop will also come further examination for queens and disease. If excluders are to be used, the beekeeper should combine some definite system with their use or he is apt to defeat their purpose by restricting too closely the breeding-room of the queen and thereby weaken his colonies.

Following the storing of the crop will come its harvest, with consequent necessity for knowledge of different appliances for extracting and storing and precautions to be taken should there be a honey dearth at extracting. Then one cannot be too careful, if placing escapes, to make all tight above them, guarding against robbing of the unprotected honey. Robbing around the extracting house should be checked as much as possible and sticky supers returned only at the close of the day during the dearth. Unprotected combs should be kept free of moths.

With the middle of summer, colonies should begin to be prepared for the winter rest. There will be necessary, an abundance of stores, plenty of young bees, and sufficient protection can be given later in the fall, and to some extent, the added stores, but the young bees must be raised soon if they are to be in abundance for the winter cluster.

With the fall will come the supplying of stores, should the beekeeper not be fortunate enough to have been sufficiently provided by natural honey-flows. The choice of wintering systems will also have to be made, whether it be cellaring or out-of-door wintering by some approved method, the choice being determined by the variability of the climate in each section of the country and the protection afforded by natural methods, such as windbreaks, etc.

One of J. F. Diemer's outyards in the Missouri River hills, near Liberty, Mo.

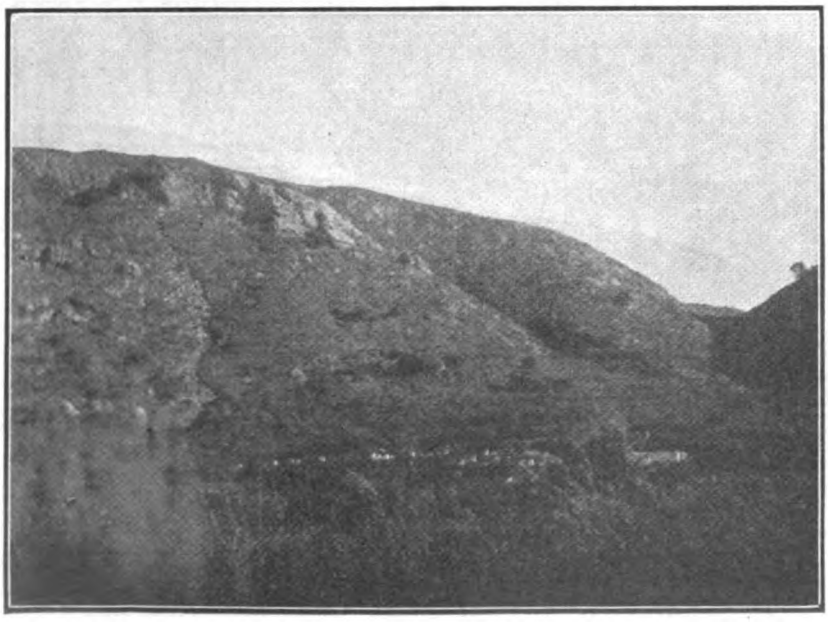
In fact, the activities of the wide-awake outapiarist will be a constantly changing panorama, from early spring till his bees are placed for their long winter rest, nor would such efforts be much mitigated by the winter, were he as active in the disposition of his crop as in the harvest. It seems very strange that a beekeeper should devote so many months of the year and so much labor to the preparation for the harvesting of the crop, only to turn around and sell it to the first buyer. I believe the time is fast approaching when marketing will be as truly a part of the honest efforts of the beekeeper as is production. Then the beekeeper will get out and create a market, instead of waiting for the market to be developed from without.

The wise manufacturer first creates a demand for his product, then works to supply his customers. Why should the beekeeper do otherwise, first producing his crop, then later making a more or less feeble effort at selling it?

Knowledge of Territory

It is imperative that each beekeeper know his territory. He must know the extent of the flora in his section so as to be able to determine how many colonies he may place in each location without overstocking.

But with the elasticity in opportunity for outapiary expansion by means of the automobile and truck, he should do more than this; he should study carefully his territory for 100 miles in each direction. He may, by this same means, place his apiaries to best advantage, and he may, moreover, change locations (migrate) with his bees to an extra crop. An instance of this may be mentioned in the case of the Dadant apiaries during the season just passed. White clover, our main flow, was a failure, and such little as there was, together with sweet clover, was used in making increase. Careful observation showed us, however, that the drought had not affected the growth of weeds in the Mississippi bottoms some distance away. By the aid of two large trucks all of the 700 colonies in these apiaries were moved into the bottom for the added harvest with the result that a haul of forty miles at the most meant an average of from 75 to 100 pounds to the colony instead of a summer



Outapiary at foot of a mountain in California. A variety of forage is within reach of a location like this.

One of Bunger's outyards at Eskridge, Kansas.

dearth, with consequent necessity for liberal feeding to get colonies in condition for the winter.

If possible it is very desirable to get contour maps of your own county and those adjoining, then get in touch with county agents to find out the possibilities. There may be a tract of alsike or sweet clover fifty miles away to which it would pay to move an apiary. The rainfall may vary considerably over a radius of 100 miles, so that there may be a drought in one sector and prodigious rainfall in the other. Migratory beekeeping in days past was uncertain, but not so much now over a distance of 100 miles or less, with the big truck mode of transportation.

Many beekeepers in California practice it, and not only move from one crop to another, but are able, by careful planning, to take advantage of several crops in a single season. The Edson apiaries in Northern California, load 100 colonies at a time on their big four-ton truck and travel from one flow to another. Their apiaries are placed in units of this number of colonies for best results. Some apiarists catch the early flows in California and ship by rail to Nevada or Utah in time for the alfalfa there, to return to California for the fall. But the long overland haul by rail takes much experience and had best not be attempted unless the beekeeper is in a position to stand possible loss.

Systems of Management

With special reference to the crop and its harvesting, there are three general systems of management practiced by the best apiarists of today. They are the system with the temporary or portable house, that with the permanent house, and that with the central extracting system. Each has its advantages. Each fits in with conditions applying to individual beekeepers.

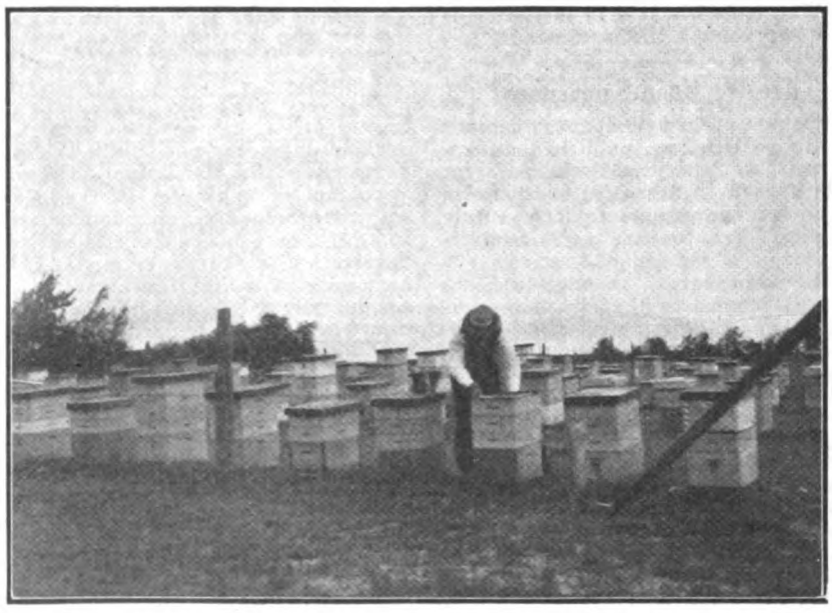
Where apiaries are not located permanently for year after year, and conditions not desirable for erecting a well-built, permanent honey-house, very often a small building of temporary structure is provided for housing supers, hives and utensils; the extracting being done in a temporary house made of muslin, screen or some other suitable material, put up at extracting time, to be taken down and removed to the next apiary as soon as the crop is harvested. Many use tents for this, but these are at best a makeshift, since they are hot and difficult to make bee-proof.

Where the apiary can be permanently located, a well-built, permanent house is much better, and it should be made large enough to hold all supers and extra equipment. A house 16x20 feet is not too large. In this a permanent extracting outfit may be located, though the usual rule is to carry the extractor and equipment from apiary to apiary as the work progresses. Such houses may be made sectional, so as to be easily moved in case change of location is desired. Many are made, either with wintering cellar beneath, or with cellar to be used for storage tanks, so that the honey may be piped directly from the extractor and capping can or box.

Very recently, the central extracting plant has met with favor by those who have tried it. With this system, all honey is hauled home to be extracted, and the building is made sufficiently large for the most modern equipment in every particular. Extractors (possibly two or more of them), are run from one shaft, which may also run a honey pump, etc. Steam for heating honey, melting wax and heating the honey knife, as well as for heating water and the rooms of the house, is provided by one boiler. Hot and cold water, a carpenter shop, etc., may be provided.

There are many advantages to this system. Centralization naturally allows of best methods with minimum outlay. Work is done at home under constant supervision and all equipment is at hand where it can be readily cared for. Apiaries may be changed in location with least annoyance.

Yet there may also be disadvantages. If foulbrood is prevalent in the outapiaries, there is danger of spreading the disease by the intermixing of combs. In hot weather, combs of honey may melt while being hauled home, or if it be cool, they may break badly. Sticky supers have to be returned, with consequent robbing. The roads may become muddy and not allow taking off supers when they are ready. If the supers are removed during a honey dearth, robbers will be bad, and by the time



A Colorado outyard.

you have your truck loaded, they may be around you in a swarm.

It would seem better to have a small house at each apiary, in which supers might be stored in case of necessity. It would not need to be large, but should be absolutely bee-tight.

Very few who have tried the central plant would willingly return to their old method. Every man to his conditions, however. A large majority of extracting systems are still run with all extracting done at the outapiaries, and many of them probably more advantageously than with the central extracting house.

Automobiles and Trucks

No doubt that the automobile and truck are responsible for most of the improvement in the methods of running outapiaries over what prevailed twenty years ago. Yet the beekeeper should figure costs very carefully before coming to a decision as to what type to use.

The beginner will probably be content with the pleasure car, or one which has been remodeled for his needs. He can accomplish all work except the hauling home of the honey with it. It may pay him to have this work done by hired machines.

Likely the apiarist with three apiaries or less will do well with the converted machine, having his heavy hauling done outside. The beekeeper with five or more apiaries can use the light truck (one ton or less) to advantage, while a system with 1,000 colonies or more may find the big truck of advantage. But in this instance, there will have to be smaller cars for regular apiary work.

Not enough attention to costs is paid by any beekeeper. We know of one or two apiarists who have bought trucks beyond their needs, running their operating costs much higher than if they had chosen a smaller machine.

As in many other branches of beekeeping, the choice will have to be made by the individual beekeeper. Each one should be best able to determine from his system just what is most suitable to his own needs.

Are We Good Samaritans?

IN the October number, under the above title, we published an appeal to American beekeepers for help for their destitute brothers in Europe. The responses are surely coming. Yes, we are good Samaritans!

We were barely through mailing the last copies of the October number when the first responses came, October 3. Here are the first two letters:

"I have just read your editorial, 'Are we Good Samaritans?' It hit the spot with me. I am sure there are thousands of beekeepers in the United States who want to help the unfortunate beekeepers in France and Belgium and are glad to see you start the ball rolling.

"I am enclosing check for $104. Use $100 as you think best for Franco-Belgian relief and $4 to advance my subscription 5 years. I wish you great success.

"HARRY CRAWFORD,
"Broomfield, Colo."

Second letter:

"I have had a good crop. Can get 25 cents for all my honey at home. Read your proposition to help those beekeepers living in the war zone. A little from our beemen will put them again in the bee business and we will not miss it. I enclose $2, for which they can get some fixtures, frames, etc.

"HERSCHELL FELTON,
"Late Sgt. 1, Co. H., 37th Ill Vol,
"Millersburg, Ill."

These letters are in the right spirit and I was enthused to receive them so quickly. But listen:

Leon Tombu, of Huy, Belgium, formerly president of the International Congress of Beekeepers that met in Brussels in 1910, now secretary of the same organization to meet in Rome in 1920. Mr. Tombu is very active in war relief for the spoliated and homeless beekeepers of Belgium and France.

The very next day I had a visit from Hugh L. Cooper, the great hydraulic engineer who built the big dam across the Mississippi. He was a colonel of engineers in the great war. He helped rebuild and enlarge some seaports in France, and saw the devastation of those countries. As he spoke to me of those matters, I accidentally mentioned the subscription work we had undertaken to help the Franco-Belgian beekeepers. I told him of Harry Crawford's prompt response with $100 subscription. With his customary briskness and wholeheartedness, he quickly interrupted me and said:

"Mr. Dadant, I'll meet that man's subscription." "What, do you really mean to say that you will give us another hundred for the beekeepers of Europe?"

"Exactly, Put my name on the list and I'll send you my check for $100."

Here we are, only a week from the publication of the appeal and our list of help is as follows, in addition to the October subscription:

Harry Crawford, Broomfield, Colo. ---------- $100
Herschell Felton, Millersburg, Ill. 2
Hugh L. Cooper, New York City 100
Lutz & Stahl, Printers of American Bee Journal ---------- 5
A. A. Augenstein, Dakota, Ill----- 5
M. M. Martin, Caledonia, Ill. ---- 5
John M. Davis, Spring Hill, Tenn. 4 doz. queens (Italian)
Allen Latham, Norwichtown, Conn, ---------- 25 queens (Italian)
G. B. Lewis Co., Watertown, Wis. $200 in supplies at wholesale

Do we need more? Yes, certainly. The damages to be paid by Germany wil be insufficient. Looking in any direction, we find statements confirming that view, from entirely disinterested persons.

For instance, Bishop Theodore Henderson, of the Methodist church in Detroit, writes, in "Victory":

"It is understood that the construction of buildings will be done by the French Government, but it is estimated that, even if the maximum reparation money is secured from Germany, there will be no surplus for the villagers to secure kitchen utensils, garden tools, farm implements, household furniture and the like."

The Anglo-American Mission of the Society of Friends sends us an appeal for bees or supplies.

Mr. Leon Tombu, 26, Rue D'Angleterre, Huy, Belgium, who was President of the International Congress of Beekeepers, in Brussels, in 1910, and is now Secretary of the same organization, wrote us several times in view of securing bees or supplies from American beekeepers. He made a trip to Italy, during the summer, to arrange for the shipment of Italian bees to the devastated regions next year. He expects that it may be possible to secure bees, in the spring, from Germany and the Netherlands. He writes us as follows:

"We are very thankful for your proposed help and also for the encouraging letters received from Dr. Phillips, of Washington. I have transmitted a copy of your letter to the Director-General of Belgian Agriculture, who feels very thankful for your efforts. You are right in stating that America is rather distant for us to secure gifts of colonies of bees and receive them in good shape. But if we can get bees elsewhere and supplies or cash from America, we can probably help rebuild, in small part, our destroyed beekeeping."

The French "Commission for Rebuilding Destroyed Apiaries" is securing some help from the unhurt parts of France. It is publishing a subscription list in L'Apiculteur. But when we consider that France has lost as many men as our entire A. E. F. (nearly two million), that 90 per cent of her industries were directed, for at least 4 years, to the making of arms and ammunition, that some of her best land is now a chaos where nothing can be grown, and that her money values have depreciated, we

can easily see that it will take but a small effort on the part of American beekeepers to more than treble the gifts expected.

We are deriving profit from high prices and those high prices are due in great part to the suffering of Europe. If each reader of one of the American bee magazines was to give but 50 cents, it would constitute a liberal donation to Belgium and France, in beekeeping. There is plenty of generosity in this country and it has not reached the limit. Come, friends, let us have your subscription, no matter how small. Large ones accepted. Everything will be acknowledged and a statement published of where the money and supplies go.

We don't expect subscriptions from all our subscribers. But we do know that if they can afford to send a remittance such as they will probably not miss, they will feel great pleasure in having helped. Dollars, in American money, just now, increase in value nearly 60 per cent, when changed for French or Belgian funds. We propose to forward the cash remittances before the European funds regain their value, and we are going to be very careful to secure proper distribution.

Grading Honey in New Zealand For Export

By I. Hopkins

SOME 25 or more years ago, when our export trade in butter, cheese and meat began to assume fairly large proportions, and promised to expand enormously in the future, provided it was conducted in a straightforward manner, our Government, with commendable foresight, took a hand in it, with the object of preventing, through fraud or carelessness any injury to the growing trade by the export of inferior produce. Legislative measures were passed, regulations formed, and official graders appointed; and none of the commodities mentioned were from that time allowed to be exported without being officially graded and stamped as to grade. The effect of such regulations was that the export trade went ahead with the proverbial leaps and bounds, because it gave confidence to buyers without examination. The Government grade marks were sufficient. Today the annual value of our export trade in butter, cheese and meat is an enormous sum for so small a country.

The foregoing is a brief account of the commencement of our grading system. I may state that practically all our export trade is with Great Britain.

The first honey raised in New Zealand under the modern system of beekeeping, exported to Britain, was raised by myself in 1883, and subsequently, in 1888 and after, I exported considerable quantities of the best quality. This was the means of creating a good name for our honey, which it has retained ever since. In order to preserve the good name it was considered advisable, some years ago, to include honey in the grading system, and in November, 1915, Government grading regulations were gazetted and they became law, since when no honey has left the country ungraded. The confidence of oversea buyers is evidenced by their purchases en route on the Government grade marks. I enclose a copy of our grading regulations, from which you can quote the salient points.

Aukland, New Zealand.

(Our esteemed contributor includes with his letter a copy of the New Zealand grading regulations. These are too lengthy for full insertion, but we pick out the following interesting points:

No honey may be exported until it has been graded. Four different ports are named in which honey may be graded and the location given where the grading is done. The honey must be divided into uniform classes, with distinguishing marks, if not of the same kind or quality. All honey submitted must be granulated. No honey is graded or allowed to be exported unless granulated. It must be packed in clean, strong tins, lacquered or oiled on the outside to prevent rusting, with leak-proof lids which may be removed and replaced easily. The packing cases must be clean and new and constructed of well-seasoned timber, planed on the outside and strapped with metal or wired. They must contain not to exceed 120 pounds net. The cases must be branded with an export brand to be registered and approved. The net weight of the honey to be marked on the cases.

The honey is divided into 4 classes, white, light amber, medium, dark.

No charge is made for grading.

Each class is divided into 4 grades:

A, Special grade, 94 to 100 points.

B, Prime grade, 88 to 93½ points.

C, Good grade, 80 to 87½ points.

D, Manufacturing grade, 65 to 79½ points.

For the purpose of grading, the maximum number of points that may be allotted to each class in respect of the several qualities follows:

Flavor	40 points
Color	10 points
Condition	15 points
Grain	12 points
Aroma	8 points
Freedom from scum and froth	10 points
Packing and finish	5 points
Total	100 points

In our exceedingly free country, the first impression of the reader in regard to such a government regulation is: "too much paternalism." But what if it renders export more easy and protects the honest producer against the speculation of dishonest middlemen and unfair producers?

Some years ago we read a book entitled: "Newest England," by Henry Demarest Lloyd, a description of New Zealand and its progressive and democratic administration. It has left to us the impression of wonderful possibilities in an entirely different method of democratic government from that to which we are accustomed.

Those people at the antipodes may have good ideas, worthy of investigation.—Editor.)

To National Association Members

SOME time ago the writer addressed an appeal to each United States Senator and Representative from California urging their endorsement and support of the bill introduced in the Senate by Senator Arthur Capper, of Kansas, making it entirely legal for workers of the soil to rganize and cooperate. Many interesting letters have been received from these gentlemen in reply, and since California is a hotbed of co-operation, particularly among the producers of the soil, the beekeepers will be pleased to know that the sentiment in favor of co-operative organizations among the farmers is running very high.

The writer, as Secretary of the National Beekeepers' Association, asks that beekeepers everywhere, and particularly the officials of beekeepers' associations everywhere, write to their United States Senators and Representatives urging similar endorsement of the Capper bill in the United States Senate and in the House of Representatives.

The beekeepers should organize on strictly co-operative lines; by that we mean non-stock, non-profit associations. They should be reasonable, just, and not exorbitant in their prices, and strive to build a dependable outlet for their goods, with a firm policy in the matter of grading, packing and branding, and maintain at all times a serious and watchful consideration for the laws of supply and demand, keeping their honey always moving out freely on to the market after the assembling period has commenced. By carrying out these principles and processes they command the respect, interest and attention of the buying public; they win valuable and confiding customers for their goods. The benefits of organization give them a handsome reward and maintain an unbroken link from producer to consumer. The producer is by this steady outlet insured a normal return every year for his effort, labor and skill; production is thus greatly increased; the consumer reaps his large reward in the increased production, which likewise ultimately the new distributing system can handle at the lowest conceivable cost, thus benefitting both producer and consumer alike, eliminating needless speculation and preserving only the legitimate and necessary middleman.

It costs only $1.50 a year to join the National Beekeepers' Association and help along our work in this and a hundred other similar ways. The new slogan should be: "Government of the beekeepers, for the beekeepers and by the beekeepers."

CHARLES B. JUSTICE,
Secretary-Treasurer National Beekeepers' Association, 318 Investment Building, Los Angeles, Cal.

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language. Consolidated with The National Bee Journal in 1874.

Published monthly at Hamilton, Illinois.

Entered as second-class matter at the postoffice at Hamilton, Illinois.

SUBSCRIPTION RATES—In the United States and Mexico, $1 per year; three years, $2.50; five years, $4. Canadian postage 15 cents, and other foreign countries 25 cents extra, per year.

All subscriptions are stopped at expiration. Date of expiration is printed on wrapper label.

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THE EDITOR'S VIEWPOINT

Granulated Honey

We call the attention of our readers to the contribution, in this number, of our esteemed friend, I. Hopkins, of New Zealand, with the export regulations of the New Zealand Government, accompanying the letter. It will be noticed that "no honey will be graded or allowed to be exported" out of New Zealand, "unless it is granulated."

The authors of this ruling evidently recognize the fact that good honey usually granulates unless it has been doctored or heated. The New Zealand authorities are not the only ones who appreciate this fact.

A few weeks ago, among our correspondence with foreign dealers in extracted honey, we received a letter from an experienced purchaser containing the following:

"Please note that I want **exclusively** candied honey, as it would be very difficult for me to sell melted honey."

The granulation of honey has been a stumbling block in the way of the sales, in this country, because the public has been accustomed to liquid honey. The beekeepers are at fault in not trying to convince the consumers of the quality of granulated or candied honey. Sooner or later, the consumer of America must learn, as he has learned in Europe, that granulated honey is pure and often of better quality than liquid honey, which may have been heated to prevent granulation or to melt it.

There are, indeed, cases when pure honey of good quality remains liquid, but these are the exception, not the rule, in our changeable climate.

Granulated honey is much safer to ship, with less danger of leakage and loss than liquid honey. A great deal of worry and annoyance would be avoided if granulated honey was accepted at its par value, on the American market (as it will sooner or later be), instead of being rejected as impure by the uninformed consumers.

Dummies vs. Division Boards

The Bee World establishes a difference between a dummy and a division board, as follows:

"Correctly speaking, a dummy is more or less a replica in wood of an even frame with comb. It is exactly of the same outside dimensions and thickness, and is meant to replace the latter. A true dummy, to be strictly correct, should be double-walled, but this form of accessory hive furniture does not exist in numbers on the market, except in the developed form of the Doolittle feeder, being usually replaced by a board of equal external linear measurements.

"A division board, on the other hand, should be of such shape and dimensions as to be capable of insertion between and parallel to the combs in the same way as a dummy, at the same time being capable of complete division of the hive chamber in which it is inserted.

"It will be seen, therefore, that a dummy permits of the creation of a bee space in the same manner as a frame comb does; whereas a division board entirely obliterates such a space by being made to touch the internal surfaces of the front and back walls of the hive, in addition to the floor board, when employed for the brood chamber, as is usually the case."

This is a clear and rational classification and description of the two implements. We might add that the average dummy sold by dealers is a very thin board, the use of which appears to be confined to giving opportunity for the handling of the frames, after its removal from the hive. It is of no use to concentrate the heat, in reducing the number of frames for a small swarm, since a dry comb is about as efficient as a non-conductor. But the division board, which fits at both ends, against the walls of the hive, prevents the circulation of air and effectually confines the heat produced by the bees, even if it does not fit down against the bottom board.

Those who have tried division boards are not usually in favor of a full depth board, but prefer a bee passage at the lower end, to avoid crushing bees in manipulations and also to permit bees which may accidentally find themselves behind it to return to the cluster. Warm and dry material, such as forest leaves, or possibly chaff packed in a light sack, may be used behind the division board, in winter, when bees are confined on a less number of combs than the usual quota.

We make the ends of a division board to fit snugly, while it may be easily loosened from the ordinary amount of propolis used by the bees, in the following manner:

Cut the division board a full half inch shorter than the inside length of the hive. Then nail upon each end of it a round cushion made of painted cloth with some soft material beneath it, which may be easily loosened, by a slight jar, from the walls of the hive. Such division boards prove very efficient in keeping up the warmth of a small cluster, in wide and spacious brood chambers.

The Netherlands Bee

Having read, at different times, in the British Bee Journal and in other places, the praise of the Netherlands bee, the editor concludes that it is well to place before our readers, in this number, the statement of a Netherlands beekeeper, in praise of this bee.

Looking upon it in an impartial manner, we readily detect that the bees of Netherlands differ little if any from the common black bee of the continent; that their prolificness cannot be very great, since the skeps in which they are kept are so very exiguous that their swarms do not average more than two pounds. A study of the map also shows us that there are no mountains between Holland and Germany; therefore, noth-

ing to prevent the uniformity of the black bee.

If nomadic beekeeping is advantageous to the bees ,causing them to become more active, through transportation to and from special crop regions, then the Italo-American bees of the United States, which are kept in much larger hives, with more inducements to the prolificness of queens, and in many cases shipped back and forth to take advantage of extra crops, and exposed to rigorous winters, should be and undoubtedly are very superior to the bees of Holland.

In view of the necessity of importation of bees into the devastated regions from somewhere, the bees of the Netherlands will probably prove quite desirable, for that little country is only a few hours' ride, on the railroad, from the scenes of destruction of the late war. If the beekeepers of northern France and Belgium secure swarms from Netherlands and improve the stock by the insertion of a few hundred American-Italian queens, they will probably have better bees than ever before. So let us volunteer to send them a few queens of good stock, the coming summer, to help them out.

An International Bee Magazine

"The Bee World," an international monthly, edited by Dr. Abushady, at Benson, Oxon, England, made its bow to the public with its June number. It is interesting, and if it fulfills its program, will prove of use, for there has not been an international bee magazine since the disappearance of Edouard Bertrand's "Revue Internationale," published in Geneva years ago. "The Bee World" began its international life by giving extracts from 12 bee magazines, all, however, being publications in the English language. We wish the new magazine success.

Macedonian Beekeeping

The article on uses of honey and wax in Macedonia, of Mr. Tabusteau, translated from L'Apiculteur, and published in the American Bee Journal for October, appears to have interested a great many readers. We had written him, before the publication of the article, to ask whether he could supply us with some Macedonian photos, referring to beekeeping in that country. His letter, received too late, enclosed 2 pictures, which we publish on page 380:

"Ste Eulalie, France, Aug. 26, 1919.

"Dear Mr. Dadant: I am very happy to comply with your request, and authorize you to publish what I wrote for L'Apiculteur. I do not wish any pay, but am desirous to please you, for I have not forgotten the honor of your visit in Bordeaux in 1913. I enclose the only two photos which I have on the matter. They represent, 1st, a small skep apiary in Macedonia; 2nd, the apiary of the School of Agriculture of Sedes, near Salonica. You will see, by the poster in the picture, that your name is known even there, the hives in that Macedonian apiary being Dadant hives.

"Accept my best wishes,
"M. TABUSTEAU."

Death of Joseph Theiler

Joseph Theiler, of Rosenberg, near Zug, Switzerland, died August 21. Mr. Theiler was the owner of the most interesting bee museum in existence. This museum is well enough known to be mentioned in the tourist guides of Switzerland, and we visited it in 1913. An account of this visit was given in the American Bee Journal of August, 1914.

Criticism

We do not wish to be considered infallible in experience, in theory, or in practice. If we did, we would surely make a failure of what we undertake. We live and learn from day to day and our true friend is the man who shows us a better implement than the one we use or a better method to keep our bees, to winter them, to prepare them for the honey crop, or to dispose of that crop.

So we need criticism, each of us. But it must be judicious and kindly criticism, written with the view of making an improvement in what we practice. Some men are backward in telling what they have found out, and need to be urged; while others are ever ready to find fault without considering that their way may not suit the conditions, because their circumstances are different.

But our true friend is he who calls our attention to a defect in an implement or to a weak spot in an argument, who does it kindly and with the sole purpose of helping progress.

So, dear reader, when at any time you have a way which you consider better than the methods published, no matter in what detail of beekeeping, let us have it.

It may not prove of value because of different conditions of climate, or crops, or other circumstances. It may have been tried and discarded. But even if, for some reason, it cannot be used, no harm will be done. "Many mickles make a muckle," and your contribution, if ever so little, should be brought forward to help if possible in the building up of the industry.

Bees and Orchards In Holland

In the British Bee Journal of August 21, "Centurion" writes of his being in Holland and visiting beekeepers. He writes: "Whereas, 15 or 20 years ago, the beekeeper had to pay to be allowed to place his bees in orchards, nowadays not only the fruit growers let the hives in free, but often pay a small fee for them to be put in their orchards This change, whereby the apiarist is relieved of paying for the use of the orchard, and sometimes becomes payee, is due to the government leaflets which have impressed the fruit growers the great value of the bee for cross-pollinizing the flowers."

The world is surely growing in knowledge and our industry is getting recognition everywhere.

An Extractor Worth While

Calling upon E. E. Coveyou, at Petoskey, I saw in his honey-room an extractor of sufficient capacity to take and extract, at one time, the honey of 64 Langstroth frames, or 128 shallow extracting frames. And the beauty of it is that the frames are slowly reversed, as they are placed in baskets which slowly revolve inside of the machine, so that both sides are extracted without any change of motion. This machine is patented. It has cost Mr. Coveyou several years of work and experimentation, but now appears to be a success. The only objectionable feature is the cost of the machine, which will be, I am told, about $300.

Foulbrood

An article on foulbrood, written in the French language, by our editor, for the Swiss "Bulletin D'Apiculture," was so well received that the Swiss editor republished it in pamphlet form. It has since been copied by several bee publications, among which we will name the Algerian annual "Nahhla" and "L'Abeille" of Quebec. Our thanks are extended to our contemporaries for this honor.

COMB HONEY PRODUCTION IN COLORADO

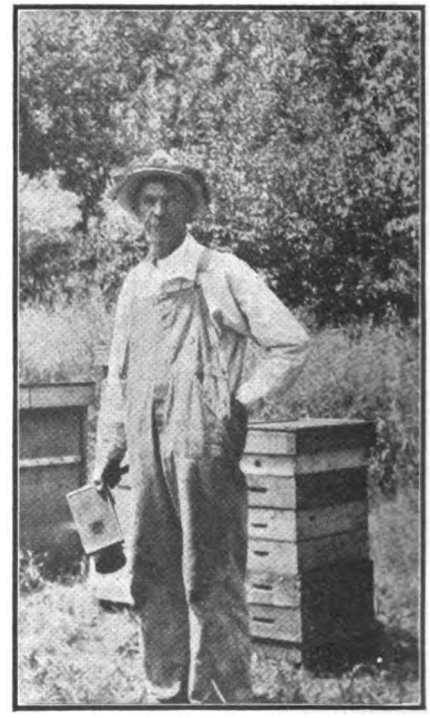
Glimpses of Some of America's Extensive Beekeepers, Their Localities and Methods---By Frank C. Pellett

COLORADO is a magic word to the summer tourist. The spell of her mighty mountains, the lure of her trout streams and the joy of motoring over her many good roads, attract thousands of vacationists during the heated months of summer. Colorado's mountain parks are rapidly becoming the playground of the nation. Fortunate is the man whose daily work is amid such surroundings. Some of the best beekeeping territory in the State is along the eastern foothills of the Rockies, from Denver north to Ft. Collins.

It was my pleasure to visit several well-known beekeepers of this region during the month of August, just when the honeyflow was on and conditions were most favorable. Prospects had not been favorable early in the season, and it was feared that the crop would be short. A turn for the better set everybody to hustling on the supers and honey was piling up at a great rate at the time of my visit. Several days were spent with the beekeepers, in their regular work in the apiary, in order to note any difference in practice due to local conditions. There are few localities where comb honey is still produced on the scale of Eastern Colorado. The men visited are experts who know their business and who are making money. While their methods differ widely, in some respects, from those practiced in the East, I would hesitate to question the judgment of such men that these methods are best for their locality. In the East we find that good winter protection is very desirable, if not essential. In Colorado few beekeepers provide anything except plenty of stores and a good windbreak. Most of them are agreed that a windbreak is very desirable. I found several who are experimenting with winter packing, but no one was quite ready to say that the results justify the extra cost. While the nights of winter are cold, there is almost constant sunshine during the day and the periods when the bees are unable to fly are short. Under these conditions most of the colonies come through the winter, although sometimes considerably weakened.

Herman Rauchfuss has several winter cases in each of his apiaries. He has built them substantially with plenty of packing and there is no question but that the bees come through in fine shape in them. Although he expects to continue their use for some time and give them an opportunity to demonstrate their value, he is not yet convinced that they are worth the extra cost. I failed to find a single beekeeper, in this section, who is a warm advocate of winter protection such as we think necessary further east. There is unquestionably a great difference in conditions, yet to the outsider it would seem that some extra protection would relieve the bees of a heavy tax in generating heat during the cold nights.

A man who is prejudiced in favor of extracted honey production and an advocate of the large hive, gets something of a jolt when he finds so many men doing things in a big way with the 8-frame hive and who object to anything larger. It is readily apparent that the large hive is unsuited to comb honey production, while the small hive could be used for extracted honey without serious inconvenience. However, in most localities the production of comb honey on an extensive scale has been abandoned in favor of extracted honey and probably will not again be resumed. The market during the wartime period has favored the extracted honey producer and the general impression is that it will continue to do so. It may be that so many will turn to extracted honey that the demand for comb honey cannot be met and that those who continue to produce it will profit by their persistence. While present prices make comb honey profitable there is not as much difference in price as the extra effort necessary to produce a fine article would justify.



Herman Rauchfuss is probably the most extensive comb-honey producer in Colorado at the present time.

Herman Rauchfuss produces comb honey in outyards quite successfully.

Herman Rauchfuss combines his manipulation for swarm control with the making of increase, thus doing away with one serious objection to the small hive. He winters in two stories with a large reserve supply of honey. A sufficient supply is insured to carry the bees through the uncertain period of spring and, with two stories for brood rearing, he has in effect a large hive during the brood-rearing period. His main flow is from alfalfa and comes in August. At the beginning of the first honeyflow his two-story colonies will usu-

Harry Crawford, a well-known comb-honey man of Colorado.

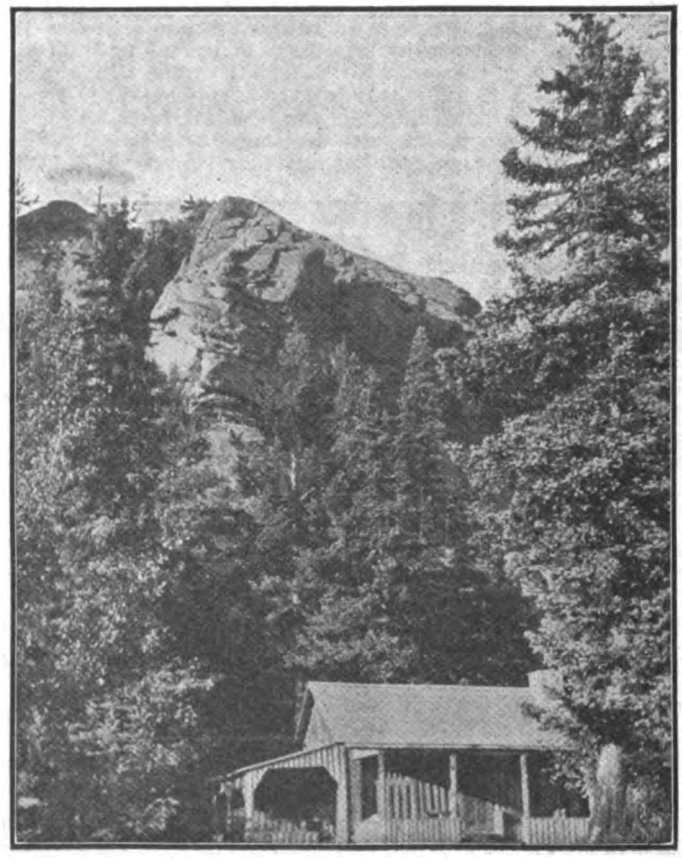
ally be full of brood and honey. A flight hole is provided in the upper hive body. This is lifted off and a comb-honey super set in its place on the lower hive body. On top of this comb-honey super is placed a honey board with the escape hole covered with queen-excluding zinc. The upper hive body is then replaced on top of the original hive with the super between. There is then an opportunity for the bees to pass back and forth between the two compartments, but the small opening through the escape hole covered with excluding zinc does not facilitate free movement. The bees soon use the flight hole in the upper body freely. At the end of eight or nine days the division containing the laying queen is removed to a new stand and all queen-cells cut from the queenless portion. A virgin queen is given to the colony remaining on the old stand. If he has been too busy to rear a sufficient number of young queens, he usually finds enough ripe cells to supply one to each new division. In this way it is easy to keep down swarming till the beginning of the main flow and also to build up the new colonies in plenty of time for it. He sometimes finds it necessary to give the new divisions a second story for brood rearing, in advance of the principal flow, later removing it, somewhat after the plan followed by Dr. Miller.

This method of making increase in advance of the honey flow would not be practical in the clover region where it is difficult to get the bees up to sufficient strength in time for the flow. This season Colorado beekeepers have enjoyed a good flow from the third cutting of alfalfa, coming late in August and running into September.

Rauchfuss makes a practice of placing full depth hive bodies over his weak or moderate strength colonies. In this way he secures a considerable amount of honey in brood combs. This is not extracted, but kept for reserve to make sure that all colonies are well supplied. He calls attention to the fact that many comb-honey producers lose their best colonies every year because the honey is all stored in the supers, leaving the hive body for brood. When the honey is removed the amount left in the one hive body of an 8-frame hive is not sufficient and the bees die before spring for want of stores. His plan of wintering all colonies in two stories, with a large reserve supply of honey, avoids this danger.

Herman Rauchfuss is probably the most extensive comb-honey producer in Colorado at the present time, having about 1,800 colonies in thirteen yards. It requires expert management to run so many bees for comb-honey and there are few men who might not get some good pointers from a man of such wide experience. He has one apiary, in a protected situation in the Platte Canyon, which is used principally for the production of bees. Full depth bodies are given them for storage of honey, and this honey is used in turn for building up other yards. In this apiary swarms issue early, sometimes so early that snow storms occur later. He has had several swarms there as early as May 1. On one side of this apiary is the Platte river, which furnishes excellent trout fishing; on the other side is a beaver dam. It is needless to say that visitors find much of interest besides the bees in visiting this apiary.

Until he sold his bees last spring, A. J. McCarty was probably the most extensive comb-honey man in Colorado. McCarty sold 2,200 colonies and leased the rest, and is taking a well-earned vacation. However, he is not content and will probably get back to the bees another year. When I visited at his home in Longmont, I found him a very agreeable chap and a live one, when discussing bees in general. He was exceedingly modest about his own success, however, and when it was proposed to tell something of his methods and experiences, he made a counter proposition, that we go with Prof. Spangler to his cabin in the mountains and spend the night up there. This was too good a chance to miss, and the invitation was eagerly accepted. Prof. Spangler has been a teacher in the Longmont schools for many years. Back east he would be considered an extensive beekeeper, with his three hundred colonies. He has a cabin about thirty miles from Longmont, not far from Long's Peak. It is a wonderful drive along the little stream that winds up between the high mountains on each side, and no more interesting scenery is to be found. If this was a publication devoted to travel, instead of bees, that trip to the Spangler cabin in McCarty's big White car,



D. W. Spangler's cabin in the mountains.

would furnish an abundance of material for a feature article. A trout stream runs within about thirty feet of the cabin door and but a few rods further up it is dammed by a colony of beavers, who make their home there. It is not far to the home of Enos A. Mills, the naturalist whose writings have attracted much attention to the wild life of the region.

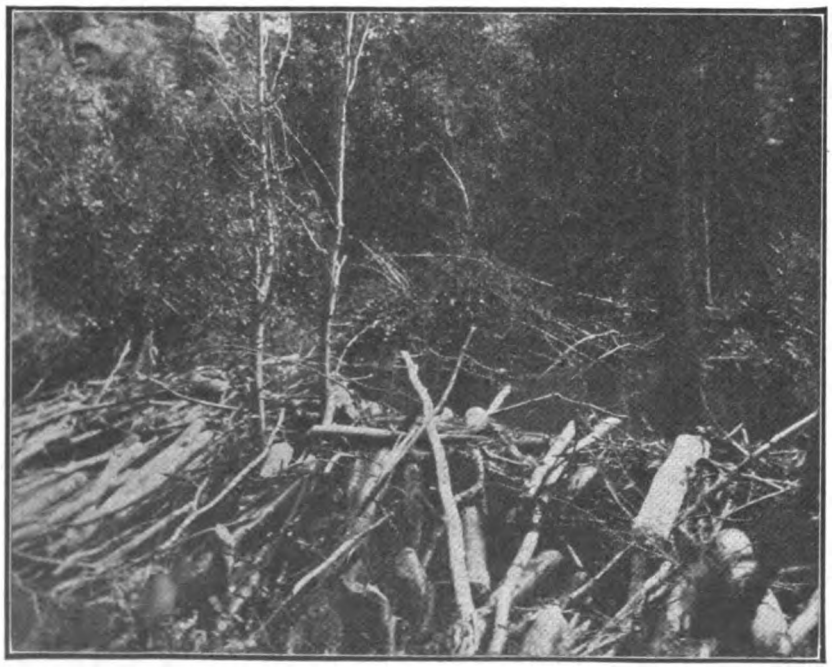
At Bloomfield lives Harry Crawford, who has made beekeeping an exclusive business for 28 years. He is, accordingly, one of the pioneers at making an exclusive livelihood from bees. He has about 600 colonies of bees and produced 900 cases of comb honey last year, besides several thousand pounds of extracted honey. He has a winter home at Long Beach, Calif., where he has gone for fourteen years to spend the winter months.

I was especially interested in Crawford's packing house, which is situated on one of the main roads to the mountains. His attractive window stops many a tourist who, after buying a small amount of honey to use in camp, becomes a permanent customer after he has returned home. He sold last season as high as $178 worth of honey in a single day to tourists who happened along and were stopped by the sign and the honey display in the window. As is shown in the picture, the house is well painted and fixed up as nicely as a dwelling. This is certainly an effective example of the value of advertising to the passing trade.

Money From Beestings

A STORY has been going the rounds of the newspapers to the effect that an eastern woman is keeping bees for the money to be made from the formic acid extracted from their stingers. It has long been known that formic acid is present in the sting of the bee and similar stories have appeared in print before. This particular news item, which we copied from a newspaper clipping in our October number, has attracted more than the usual attention. Thomas Forrest, of Hammond, Louisiana, was the first to bring it to our notice, with the request that the facts be given through the American Bee Journal.

A letter of enquiry to the Rochester Germicide Company brings the information that while formic acid was formerly secured in a small way from red ants, it is made now in large quantities by a chemical process from carbon, hydrogen, and oxygen. The Rosebreugh Chemical Corporation, of Syracuse, N. Y., was the first to make it in the United States from the raw material, it having been formerly imported from Germany. We can find no record that the sting of the honeybee was ever utilized in any commercial way.



The beaver dam behind the apiary.

The Prevention of Foulbrood

By A. Z. Abushady

Late Assistant in the Bacteriological Department, St. George's Hospital; Webb Scholar in Bacteriology, University of London.

BOTH classes of foulbrood are infectious, and both are caused by sporing bacilli. The American disease is due to **Bacillus larvæ,** whilst the European infection is caused by **Bacillus Pluton.** The morphological characters and other features of these organisms do not interest the practical apiarist. It will suffice for him to know that in the early stages of both diseases, these infecting organisms are present in their negative of non-sporing forms, whilst in the later stages of both infections, resisting spores replace the ordinary bacilli. It is helpful, also, to know, before drawing any plan of preventive procedures, that the bee food is the principal medium for the dissemination of both diseases; that although the tissues of the larvæ are the media par excellence for the growth of both organisms, nevertheless, adult bees may be infected with them, though not necessarily with harmful results to the latter; hence, such adult bees are capable of acting as "carriers" of the infection in more than one way; and finally, that the beekeeper himself may unwittingly be an active means of spreading the infection amongst his own bees, if he does not begin with himself in applying preventive measures.

Let us consider now, as briefly as possible, the various preventive measures that should be adopted by the apiarists of every country in combatting these infections.

1. State Supervision. By far this is the most important preventive measure, inasmuch as sources of infections, under such organization, are not allowed to multiply, but are immediately isolated and destroyed. The responsibility does not rest with the Government alone, but surely the success of such a supervision greatly depends on the good will and the progressive spirit of the apiarists themselves. In spite of legislative measures, they can make the scheme a success or a failure. It is also in their power (by their collective voice and unity), to induce the Government to exercise such a control. American apiarists are already enjoying such a protection; British apiarists, on the other hand, are still far from it, although they have suffered, and still suffer, from the ravages of both malignant dysentery and foulbrood.

2. Breeding Resistant Strains. This is another helpful factor, second in importance only to the former, if not just as important. No one with physiological knowledge will dispute its significance. The basis of success of preventive medicine, both human and veterinary, consists principally in maintaining and reasoning the natural resistance to disease. We may apply this with profit in safeguarding the health of **Apis Mellifica.** We may also judiciously apply the modern principles of eugenics in raising healthy and strong strains of bees. Splendid efforts in this direction are already a feature of American apiculture, but it is to be regretted that the effort is not complete. No trouble is being taken to study the qualities of other than two or three strains of the honeybee, whereas scientific research, on which the progress of the industry much depends, calls for the careful study of almost every sociable strain in its pure condition, and the conduction of experiments aiming at the raising, by judicious crossings, of one or more varieties of desirable bees.

3. The Practice of Antisepsis. The soundness of the advice regarding keeping only strong colonies of healthy bees as a protective measure

against the attack or disease, seems to depend on more than one factor. In the first place, a strong colony is always far better organized than a weak one. As a result, all its members are, comparatively speaking, in a better state of welfare, and consequently in better health. Moreover, in a strong colony the queen—the mother of the colony, and the compensating element against loss of life, whatever the cause may be—is well attended to. Again, a strong colony alone can afford the strict observation of principles of sanitation within the hive. Considering that the spores of both **B. Larvæ** and **B. Pluton** are not easily destroyed, it is difficult to believe the ordinary cleaning of the combs by the bees is in itself sufficient to remove sources of infection from previously infected combs or to protect clean ones against the lodgment of a source of infection. It is possible that a thin coat of propolis or another resinous substance of some antiseptic value is in addition spread by the bees on the surfaces of the empty cells, thus rendering any remaining spores more or less harmless. This view might be offered as an explanation for the success of the Alexander-House-Miller treatment of European foulbrood, although the requeening is not an insignificant help. Should this view be acceptable, we might ourselves copy this lesson from the bees, and include antiseptic measures amongst our preventive procedures. In any case, it is only too logical to think of antiseptics and disinfectants in combating infections, irrespective of their causative organisms and of whether they are pure or mixed.

Considering that foulbrood is principally an alimentary infection of the larvæ, it is most essential to prevent the infection of the food. During brood rearing, water is much sought by the water carriers, and it is helpful to medicate it with a suitable antiseptic. No artificial pollen or syrup that has not been previously medicated with such an antiseptic should be given to the bees. In addition, it is helpful to replace the hives at least once a year by clean disinfected ones. The gentle spraying in warm weather of the flying bees in front of the hives, also of the combs with their covering bees, and of the eggs and larvæ in the cells, with a warm solution of a non-poisonous antiseptic is highly desirable for the protection of the bees against more than one infectious disease. It means trouble and expense, but it means also safety. This practice should be frequently repeated. It will thus reduce the possibility of the establishment of a serious infection to a very low minimum. Anything less than the thorough use of an antiseptic in the manner here suggested is next to valueless. An occasional spraying of the bees and the combs is merely a wasted energy. The practice should be done methodically and frequently. Let me say in this connection that, with the proper application of a suitable disinfectant, it is sheer waste to advise destroying combs infected with **B. Larvæ.**

Our next problem is to consider the choice of suitable germicides for both external and internal use, the dosage and the correct method of their application. Generally speaking, germicides may be divided into two classes—those which are poisonous and those which, comparatively speaking, are non-poisonous. Naturally our selection, as beekeepers, goes to the second class. But on further examination we find again that most of these preparations, on account of their toxicity (however small it may be in comparison with that of the first class), are decidedly unsafe for internal administration to our bees in appreciable quantities or over a long period. And when we still further examine them we find that those which appear safe unfortunately present disadvantageous features which minimize their usefulness. A watery solution of mercuric chloride is obviously unsuitable for use in the apiary because it is a deadly poison; but we are not at an advantage, so far as internal administration to the bees is concerned, with any of the germicides derived from coal tar products, although the less toxic and most potent of them could certainly be used with safety for disinfecting hives, quilts, frames, extractors and other appliances, so long as they are not intended to be immediately given to the bees. But what about hydrogen peroxide, hypochlorides and allied preparations? Unfortunately these easily decompose, and therefore are almost valueless for medicating the bee-food, though, no doubt, their solutions for immediate use (e. g., for spraying with), would be helpful. It is easy to give many illustrations to your readers testifying to these conclusions, but it is unnecessary to undertake this analysis. Almost every germicide that I know of possesses advantages and disadvantages, and the attempt to create preparations that would prove ideal for both internal as well as external antisepsis have not met, so far, with an overwhelming success. For the purpose of external antiseptis, I would suggest a universal cheap germicide such as chloride of lime, in spite of the unpleasant odor which it gives. It is suitable for disinfecting hives, but it will not do for sterilizing an extractor, because of its corrosive action on metals. A 2 per cent solution of the powder (containing about 0.8 per cent of available chlorine) or even a 1.5 per cent solution will suffice. According to Klein, chlorine, even in such a low dilution as .05 per cent, is capable of killing most bacterial spores in five minutes. It is my intention to avoid, so far as possible, for economical reasons, recommending proprietary articles. I shall be content, therefore, with recommending an alternative preparation which has an international reputation and which has ceased to be a proprietary article. I am referring to lysol, which is now manufactured in different countries by several chemical firms. A 2 per cent solution of this antiseptic is sufficiently strong for all our purposes. A remarkable advantage of it is that it acts as a soap, and thus can remove dirt from the articles under disinfection; but it is wiser (in order to insure thorough disinfection as well as to preserve the power of the germicide) to remove beforehand all organic matter by means of soap and water, soap in itself being also of some antiseptic value. Frames infected with the organisms of foulbrood should be relieved first of their dead larvæ and infected honey, then dipped in a bath of soap solution for half an hour, then in clean water for a similar period, and lastly transferred to a lysol bath (they should be placed erect in the bath)

Crawford's packing house attracts many a passing tourist who becomes a permanent customer.

in which they could be left during the night, then taken out and allowed to drain and dry. Considering that built combs are far from being cheap in value, this trouble is justified in preference to the wasteful destruction of the combs. Such a thorough treatment should remove every risk in re-utilizing those previously infected combs. On the other hand, for the purpose of internal antisepsis, it is difficult to make a happy selection. Thymol, which is a more powerful germicide than phenol, might be suggested, but unfortunately it is difficult of solution in cold water (1 in 1500), though it is fully soluble, at least comparatively speaking, in glycerine (1 in 190); still a saturated watery solution of thymol might deserve experimenting with. Reputable chemical firms which have interested themselves in progressive research on antiseptics, have naturally kept to themselves the secrets of their success, with the result that I am unable to better serve the interests of the beekeeper by recommending a non-proprietary article of recent discovery that would suit his requirement. I have already advised in the British bee press the trial of "Yadil" (chemically known as "trimethenol allylic Carbide Compound") in connection with the prevention and treatment of the Isle of Wight disease, and if I suggest here its trial for the prevention of foulbrood as indicated above, I should like to emphasize in this connection, as I have repeatedly emphasized elsewhere in connection with the prevention and treatment of malignant dysentery, that there are other factors to consider besides the use of antiseptics, and that disappointment will invariably follow from ignoring them, irrespective of whether the beekeeper is a simple novice or a great authority of half a century's experience.

To sum up—1. as both types of foulbrood are infective, Government control and legislation are justified, and on such supervision, the first hope of the apiarists in any country in preventing the spread of this pest should be directed.

2. The breeding of comparatively immune strains of bees (apart from the general advice regarding the maintenance of none but healthy and strong colonies) is to be encouraged as well as enlarged in scope. The increase of the natural healthy resistance of the bee is an excellent germicide.

3. The use of antiseptics in an intelligent manner in combating bee infections deserves better recognition and further study.

4. These three important factors are supplementary to one another; a successful prevention or a great diminution of the incidence of foulbrood is not likely to result without their combination.

London, England.

Editorial Note: This article is interesting, since it gives the English viewpoint in contrast with the American. In England the apiaries are small and it is possible to work with a few colonies in a way that would be out of the question in our large American apiaries. There are numerous beekeepers in America who number their colonies by thousands, and the man with less than two or three hundred hives is called a small beekeeper. Even though it had been proved that treatment with drugs was practical as far as results are concerned, it would not pay us to deal with disease in that way. The English bee journals devote a large portion of their space to a discussion of drugs in the treatment of bee diseases. In America there is no prominent beekeeper who now recommends an attempt to cure any bee disease by means of drugs. Many experiments have been made with various disinfectants for the purpose of curing American foulbrood, but, so far, not one successful case has been published in this country. We agree with our correspondent that the prospect is sufficiently promising to justify further study and experiment, but would warn beginning beekeepers not to risk any but well-tried methods of dealing with foulbrood.—F. C. P.

M. C. Tanquary, who leaves the Kansas Agricultural College to become State Entomologist of Texas.

Some Important Changes

THE resignation of F. B. Paddock as State Entomologist of Texas to succeed F. E. Millen as State Apiarist of Iowa, has already been announced. Mr. Paddock began work in his new position at Ames, Iowa, in September. Mr. Paddock is well known to the beekeeping fraternity, and the best wishes of a host of friends go with him to the new home.

We have just received word of the appointment of M. C. Tanquary, of the Kansas Agricultural College, to the post vacated by Mr. Paddock. Mr. Tanquary is widely known through his connection with the MacMillan Arctic expedition. He spent four years in the Arctic regions and knows all the hardships as well as the attractions of ice-bound lands of the far North. When the relief ship failed to reach the party at the expected time, it fell to the lot of Tanquary to make the long journey of a thousand miles with a dog sledge over the ice to a little seaport in Greenland. From there he took passage on a boat for Copenhagen, where he engaged a relief ship to go north to rescue the little party.

Paddock has found special interest in bees for some time past and could not resist the opportunity to leave the field of general entomology for the special field of apiculture. We look for the work in Iowa to prosper under his direction.

We also feel that the Texas beekeepers are to be congratulated in the fact that the position of State Entomologist is again filled by a man who is keenly interested in beekeeping. Mr. Tanquary is at present a partner in a large line of apiaries in Western Kansas, hence knows something of the importance of commercial beekeeping. We believe that both positions are ably filled and that the interests of the beekeepers in both Iowa and Texas will be well cared for.

Honeycomb Production

The Scientific American supplement reprints at length Dr. E. F. Bigelow's article on "How Honeybees Produce Honeycomb," which first appeared in Guide to Nature. This article, which was noted in this journal at the time it appeared, has attracted more than the usual amount of attention. Two pages of the August 16 number of the supplement were devoted to it, and more than two pages in the August 30 number.

F. B. Paddock, who resigned as State Entomologist of Texas to become State Apiarist of Iowa.

Beekeeping in the Netherlands

By P. J. Frenay

(Translated from L'Apiculteur)

IN the Netherlands few bees from foreign countries are kept in their purity. In fact, they keep only the common bee (**apis mellifica**) which constitutes the basis of all apiaries, in France, Belgium, and in general all through Western Europe. It is incorrectly called "German bee," probably because it is similar to that of Hanover, Oldenburg, Lunebourg, etc., whose apiarists are in constant relations with those of the Netherlands.

The indigenous bee of Holland is distinguishable from its congeners of the common race by qualities sufficiently remarkable to cause many breeders to believe in the existence of a special variety, which they have called "heidebei," or "heather bee." This conception has been, in several circumstances, confirmed; as for instance, through an address of Dr. Dathe who, as early as 1830, called the attention of beekeepers to the bee of heather regions of Luneburg, Hanover, a variety of the common bee which he considered as specially interesting, through its remarkable activity in work and the fecundity of its queens; also the zoological congress of Giessen, Hesse, in which the heather bee was studied, classified it as a special variety and baptized it with the name of "apis mellifica Lehzeni," after Lehzen, the apiarist who described it.

This question of the existence of a distinct variety, is still at the present day the subject of a great many discussions, among Netherland beekeepers. It is worth while to try to get back to the origin of this variety.

Jan Swammerdam (1637-1680), a learned Hollandese naturalist to whom apiarian science is indebted for numerous and interesting observations, studied bees long before Huber. In his work, (Johannis Swammerdammii Biblia, sive historia insectorum. Leyde, Isaacum Severinum, 1737) he constantly refers to the common bees and does not appear to have been interested in varieties.

The modern Netherland writers, in their practical manuals, are unanimous in mentioning the common bee as indigenous, and say but little on the question of races. This is probably due to the fact that the local bee, by its qualities, has shown herself superior to the foreign varieties, the introduction of which was attempted at different dates.

Dr. G. A. Ootmar, alone perhaps, in his important book, "De Wonderen van het Bijenvolk" (Groningen 1916), goes into details on this subject. He recalls the fact that Theodores Clutius, of Leyde, in the little treatise entitled "Van de Bij" (1597), writes of the bee that it is small, of dark yellowish color, but not blackish; hairless, with a short abdomen. G. A. Ootmar states also that Della Rocca in his "Traite complet sur les abeilles" (Paris, 1760), states that, at that time, France imported from Holland dawn-colored bees. This race, of which there seem to be no specimens left in domesticity, was signalized by this author long before the introduction of the first Italian queens, which permits the supposition that he referred to a local race existing at that time.

Let us mention also Langstroth, who in his celebrated work, "Hive and Honey Bee," speaks of a race called "La Petite Hollandaise," which is said to be a variety of the common race.

Although the foregoing quotations do not agree well, there is no doubt that Apis mellifica is the original stock of the Netherland bee, the possible crosses with the variety mentioned by Della Rocca, or with imported bees, may have modified slightly some of the characters of the race, but they have not created a type sufficiently characteristic to permit the undoubted conclusion of the existence of a distinct variety.

The size of the workers among the different colonies shows appreciable differences; some hives are found in which the inhabitants are excessively small, while others, rarely, of a size resembling that of the Carnician. The average type which we consider as the standard, shows a trifle larger size than the common black bee.

Since this slight difference is not really an improvement of the race, we must try to indicate why the Netherland bee is so manifestly superior to the common bee, in regard to the prolificness and precocity of the queens, the remarkable activity and rusticity of the workers, and also why they winter so well. Our opinion is that those qualities are due to the conditions of breeding and to the country's climate.

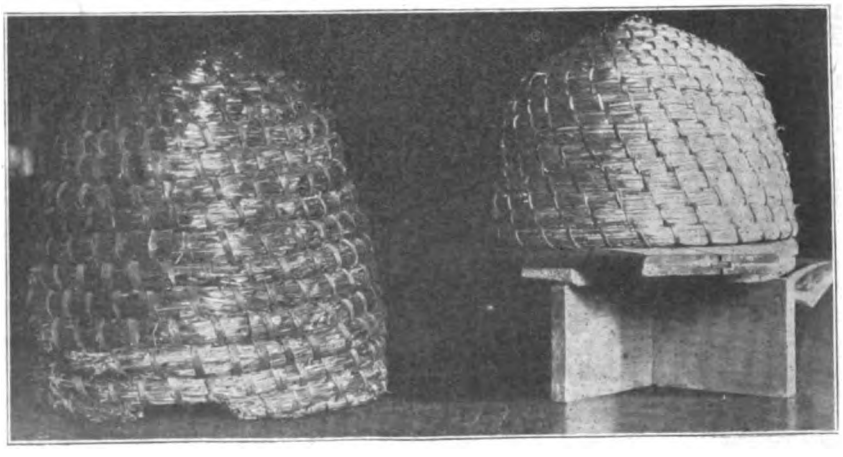
The Netherlands are formed, in the greater part, of an immense sandy plain which was conquered from the sea by the obstinate and secular work of its inhabitants. The altitude is therefore low; a portion of the country is even below the sea-level. The climate is influenced by this situation. It is essentially damp, and the presence of numerous marshes aggravates the conditions. The absence of inequalities or slopes in the land causes the country to be constantly swept by winds. The climate is so severe, the winters so long and distressing, the rains are so frequent that a national wit made the statement that in Holland one can enjoy 4 months of winter and 8 months of stormy weather.

No part of the country shows full resources of beekeeping. Although certain portions have been put in cultivation and pastures, large tracts are still uncultivated and covered with heather and pines. So the bees, having accustomed themselves to the rigors of the climate, have been subjected to nomadic beekeeping. For beekeeping here is positively nomadic.

The beekeepers of the poor sections, in which the blooming of buckwheat and heather is late, send their colonies, in March or April, to more prosperous regions, bringing them back after the bloom of the fruit trees. On the other hand, the beekeepers of the prosperous regions send their bees to the heather at the opening of this bloom, that is to say, in the first fortnight of August. Some Apiarists even move them 3 times. Those trips, of which one at least is made in the heat of summer, represent journeys of 25 to 30 kilometers (16 to 20 miles) in carts, after 100 kilometers, more or less by rail. They have helped to perpetuate the use of the straw skep, which is cheap, easily transported and stands splendidly long and unpleasant trips, when such transportation would be very expensive and dangerous for large movable-frame hives. The skeps used are of straw, 12x14 inches of inside diameter. The flight hole is at about one-third of the height.

When the colonies are located, in early spring, in a country of early bloom, the attraction of honey and pollen-bearing flowers causes them to fly in spite of unfavorable temperature. The rusticity of the race becomes accentuated by this training. The bringing in by the bees of both pollen and nectar encourages the queen to lay. This early urging every spring, necessity helping the organs, causes the queens to acquire forwardness and this quality remains.

The gathering of nectar during many months, owing to the nomadic methods, and the rigor of the climate, causing the death of many



The Netherlands bees are kept principally in small skeps.

workers, the queen must necessarily be very prolific.

From these causes flow the qualities which make the native breed distinguishable and render it a better race.

Early in May, often, the colony is already overstocked. It sends forth its swarms. These are hived in skeps similar to those of the mother colony. A good colony usually gives 2 to 4 swarms; the swarms themselves occasionally cast others, if the season is somewhat favorable.

The swarms in general do not weigh over a kilogram (2.2 pounds). Even those of a half kilogram may be accepted. Though certain of failure if they remained at the same location, their transport to the heather permits them to build up; often the last swarms succeed in storing enough for winter. The colonies which, at the end of the season, have not gained sufficient weight, are fed with denatured sugar. (A wartime provision.—translator).

The old stocks and the first swarms often reach the weight of 15 to 20 kilos (33 to 44 pounds). The colonies nursed especially in expectation of a crop may reach the weight of 25 kilos (55 pounds), and even more.

This method of cultivation presents a great disadvantage, as regards the quality of the honey produced; at the end of the season the hive containing only heather honey; harvesting, being altogether by the use of a honey press; it gives a very inferior product.

For this reason, many Hollandese apiarists have placed honey production in the background and have established themselves as "fabricants" of colonies. Very expert in the matter, acquainted usually with the handling of bees and immovable comb skeps, helped by the ownership of a very rustic race, and early and prolific queens, they succeed in obtaining a first-class product. The proof of it is in the extensive export commerce which takes place in the Netherlands, sending thousands of populated skeps every year to England and Germany. The apiarists of the neighboring countries have been able to appreciate the superiority of the Netherland bee; they introduce it regularly in their countries as an agent of regeneration for weakened apiaries, threatened or suffering with contagious diseases, or degenerated through years of consanguinity.

Small skep apiary in Macedonia.

Unluckily, bees thus produced retain a great propensity for swarming, and for this reason are not fit for use in large movable hives. However, the training of a few generations and careful selection eliminates this fault in great part. It takes several years of patience; but the results are encouraging, for the bee thus managed gradually loses her tendency to swarm, while retaining her other qualities.

The movable-frame apiarist, therefore, should protect himself, if he wishes to buy such bees. If he cannot secure large swarms produced from movable-frame hives, he should at least make sure that the skeps sold to him are inhabited by carefully selected colonies.

On the whole, the Netherland bee is a common bee slightly larger than the average. Her main qualities are rusticity and activity of the workers and prolificness and precocity of the queens. They are little aggressive. They usually build straight, regular combs. The cells, not being filled too full, the honey does not touch the cappings, which gives the sealed comb a whitish tint and a very pleasing appearance, even when it contains dark honey.

Their introduction in an apiary cannot fail to be advantageous. Their value is the greater because no contagious disease has prevailed in Holland. Foulbrood, especially, is unknown there, in the native apiaries. When, at different times, German beekeepers brought there colonies suffering from the disease, the General Government, which effectually protects beekeeping, took measures so strenuous (destruction by fire of every contaminated apiary, bees, tools, clothing and everything that might be suspected of contamination) that the disease never spread. Since 1914, all trade with Germany having ceased, not a single case has been pointed out.

Eysden, Netherlands.

Apiary of School of Agriculture of Sedes.

More Short Courses

THE Bureau of Entomology in cooperation with the Extension Service of the several States will conduct extension short courses for commercial beekeepers this fall as follows:

Boise, Idaho, November 3-8.
North Yakima, Wash., November 10-15.
Davis, Calif., November 17-22.
Fresno, Calif., November 24-29.
Riverside, Calif, December 1-6.
San Diego, Calif., December 8-13.
San Antonio, Tex., December 15-20.

These courses will, in a general way, be like those given last winter in California, New York, Indiana, Iowa and Minnesota, and like the Chautauqua recently held at Madison, Wis. Messrs. Phillips, Demuth and Sturtevant, of the Bureau, will assist in these meetings and the remaining time will be occupied by local beekeepers and local extension men. In Washington, Mr. H. A. Scullen, Special Field Agent of the Bureau, will assist.

The general plan of the course is for Messrs. Phillips and Demuth to discuss the care of bees throughout the year, giving the behavior of the bees and the application of this to beekeeping practice. On Wednesday afternoon, Mr. Sturtevant begins a series of lectures on disease, ending Saturday morning with a discussion of treatment. Mr. Sturtevant will

have laboratory equipment for examining samples, and beekeepers are invited to bring samples of diseased brood. Further particulars may be obtained by addressing the State Extension Director at Pullman, Wash., Berkeley, Calif., and College Station, Texas. These courses are, of course, free.

Making a Start With Bees

By Morley Pettit

A CORRESPONDENT writes that on account of lung trouble he has been advised to take up beekeeping. He wishes advice as to best locations in Ontario, and the capital necessary to give a return of $1,500 per year in a normal year. "In any case, what would be the most advisable course to follow?"

There are very few spots in Ontario where farming is successful and beekeeping is not. In fact, in looking over a district, we usually note the general appearance of prosperity or otherwise of the farms and judge accordingly. The soil is the first consideration. Any good farming district with soil not too heavy, and particularly not too light, will give good returns to a good beekeeper. The only other consideration from the standpoint of honey production is to avoid crowding beekeepers who are already occupying the district. In considering this matter one must look to the future and allow for expansion. If a $1,500 income is to be the goal, the two or three apiaries necessary can be placed in desirable locations almost anywhere in Ontario; but if ambitions are liable to expand with the business greater care will have to be exercised. The only way is to learn of a place where one would like to live, then go and look it over. Then try another until satisfied.

A good beekeeper expects at least 57 per cent annual income on his capital investment, exclusive of real estate. Now hold on! We are not profiteers, any more than any other skilled workers with comparatively small investment in tools. That is all the bees and equipment are, for without skill and experience they are a very uncertain investment.

By far your best plan, if circumstances permit, would be to live for whatever wage you can get with a successful beekeeper for one of two seasons. This would give you an experience that would cost you years and great expense to get in any other way. Another plan would be to buy a fully equipped apiary of 75 to 100 colonies and hire an experienced beekeeper to spend one day in the week teaching you. You will easily see that the latter plan would involve greater chances of success or failure. The plan has been worked with the best of results, but the beginners involved were real good sports, and that is one of the prime requisites of success in beekeeping.

Georgetown, Ont.

Shipping Bees in Refrigerator Cars

"I helped prepare five carloads of bees, of from five to seven hundred colonies each, which were shipped into Utah and Idaho. I left Colton, Calif., with the fifth car, which was the first car they shipped in a refrigerator, under ice, to Oasis, Utah. There were about 525 colonies, some of which had from 5 to 7 frames of brood and a strong force of old bees. These were the ones we had run for orange honey and split up after the flow was over.

"They came through in fine shape and started to work at once on the sweet clover and alfalfa and are building up in great shape. Just a week ago they shipped me another car of 425 colonies, so now I have 950 to look after, with two young lads of 17 years to assist me."

The shipping of bees in refrigerator cars has passed the experimental stage and has been found an assured method of shipping bees through the heated desert sections of the Western States, where, under ordinary methods a heavy loss of worker bees, and especially of brood, was sure to occur.

(Western Honey Bee, Aug., 1919.)

Caging Queens

By W. Griffiths, Silkmore, England

REFERRING to Dr. Miller's reply to "Ohio," in the August number of the American Bee Journal, "Caging Queens," Mrs. Saint, a first-class expert of the British Beekeepers' Association and a member of the Staffordshire Beekeepers' Association, has had an Italqueen from Signor Piana, of Italy, in a cage for six weeks. She had occasion to introduce this queen to a strong stock which was certainly queenless, but had a super on. She removed the super temporarily, opened out the brood frames slightly and placed the queen cage over the space, having previously removed the cardboard from over the candy, then replacing the super. Six weeks later she removed the super and was very much surprised to find the queen still in the cage. All the candy was gone and in the space under the cage there was a lovely new comb extending to the floor of the hive. This was full of brood in all stages, as was also the adjoining

BEEKEEPERS BY THE WAY

A Booster for Sweet Clover

For 25 years or more, R. A. Morgan, of Vermillion, S. Dak., has persistently boosted for sweet clover as a forage plant. In season and out of season he has insisted that more sweet clover would make a more prosperous agriculture. When sweet clover was thought to be a weed and it was regarded as a crime to spread the seed, he began his campaign. Sweet clover reaches its highest development in the secretion of nectar in the region from the Missouri river valley, westward. Wherever there is a large acreage of sweet clover in the plains region, we find good beekeeping territory. While Morgan has never been an extensive beekeeper, he has kept bees since the days when he lived near Adam Grimm, in Wisconsin, and became impressed with the great possibilities of the industry. He was among the first to appreciate the possibilities of sweet clover for the beekeeper. When he became convinced that the plant had a place as a farm crop, also, he began a campaign to introduce it to every part of South Dakota.

Morgan, of South Dakota

When the writer had occasion to mention Mr. Morgan's name in a letter to a State official of South Dakota, the latter replied that everybody worth while in that State knew Morgan. As editor of the Bee Department of the Dakota Farmer, he has done much for the development of beekeeping in the Missouri valley. There are few areas where sweet clover is better appreciated than in the territory where the Dakota Farmer circulates. Much of the credit for this condition is due to Morgan's tireless efforts. The pleasing thing about it is that nearly every man who has been induced to plant sweet clover as a farm crop is enthusiastic in its praise. To espouse an unpopular but worthy subject and to win over his public is an enterprise worthy of any man. We feel that Morgan is to be congratulated on his success in popularizing sweet clover in the Middle West.

comb. The queen was then relieved by removing the perforated tin, and was accepted by the bees. Now, for some reason or other, this queen refused to leave the cage; not the worker bees' fault, for they had evidently fed her and carried her eggs down into the combs, thus bearing out in every detail your answer to "Ohio." This queen was one of the number imported from Italy by the Food Production Department in connection with the re-stocking scheme, and thus was in the cage between 7 and 8 weeks.

(This is a very interesting observation, since there is only one other alternative in explanation, and that would be if the queen had gone out of the cage to lay and back again. That is less likely than the carrying of the eggs and caring for them as fast as dropped by her. It seems to us that this is another argument against the assertion that bees are "reflex machines."—Editor.)

Beekeepers of Two States Hold Meeting in Omaha

MEMBERS of the Douglas County, Nebraska, and Pottawatomie County, Iowa, HoneyProducers' Association, joined on Saturday, September 6, in an educational meeting and a social good time gathering at the summer home of Mr. W. A. Jenkins, at Carter Lake Club, Omaha. Mr. H. C. Cook, President of the Douglas County Association, opened the meeting with a talk on the various features of beekeeping. Prof. Myron H. Swank, Professor of Entomology at the State College, and also Secretary of the Nebraska Honey Producers' Association, gave an inspiring talk.

Prof. W. H. Brokaw, Director of Extension in Nebraska, talked on the value of meetings of this nature and expressed the hope that the Extension Department might employ a bee specialist in the near future. He also discussed the value of boys' and girls' club work in the State.

Mr. E. W. Atkins, Specialist in Bee Culture in Iowa, was the principal speaker of the day. He gave a demonstration in the beeyard of Mr. Jenkins, where he opened up several hives, explaining how to handle bees, how to detect foulbrood, and incidentally giving the bees a chance to sting several of the spectators. Dr. Atkins also gave a very interesting and full discussion of the methods of wintering bees.

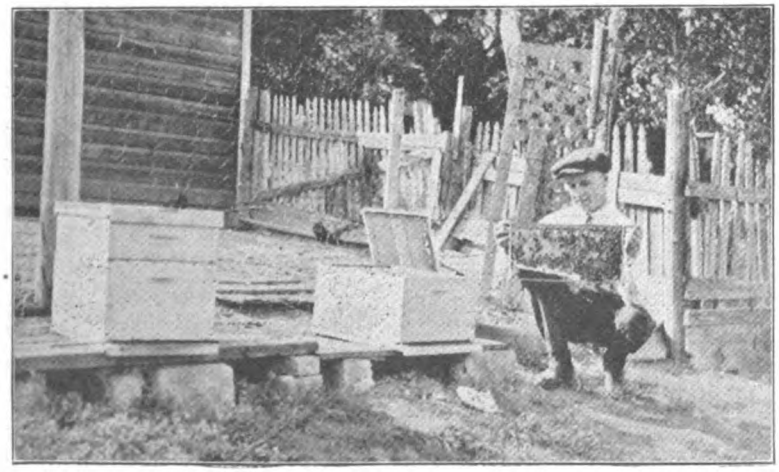
Members of the club receiving instruction in the apiary of H C. Cook, of Omaha

Another speaker was Mr. Otto Timm, who related his experiences and observations on a recent trip he had through the Rocky Mountain district.

County Agent Maxwell gave a report of the Boys' and Girls' Beekeeping Club of Douglas County. Mr. Maxwell was assisted by Mr. Cook, of Omaha, and Mr. Timm, of Bennington. Several boys between the ages of 10 and 18 years began the work June 5, with one frame of brood, bees and queen, in a modern hive. On September 6, Mr. Cook, Dr. Atkins and Mr. Maxwell judged the contestants' work. Leonard Mangold, of Bennington, received first prize, which is a free trip to the Junior Farmers' Week at the State Farm, Lincoln. From the one-frame nucleus he produced two strong colonies of bees and 24 pounds of comb honey. The cost of his equipment to begin with was $12.50. The 24 pounds of honey would easily sell for 40 cents a pound, amounting to $9.60. The two colonies of bees are easily worth $20, making a total net income of $17.10 for the first year's work in beekeeping.

M. D. Vreeland, Florence, won second prize, which was a hive and super for comb-honey production. This was contributed by the Kretchmer Mfg. Co., Council Bluffs. T. E. Grau, Bennington, won third prize, which is one year's paid up subscription to the American Bee Journal and one year's membership in the Nebraska State and Douglas County Honey Producers' Association. Eggert Ohrt, Irvington, received fourth prize, which was a copy of Langstroth's book, "The Honey Bee," and Mr. C. Clinton Dunn, Omaha, won fifth prize, which was a copy of Dadant's "First Lessons in Beekeeping." A larger club is anticipated next year.

After the speaking, a bounteous picnic supper was spread and a general good time was enjoyed by all, and it was agreed that Mr. and Mrs. Jenkins were splendid as host and hostess.



Winner of first prize in the Douglas County Boys' and Girls' Bee Club.

Gleanings Editor Ill

Since early boyhood, E. R. Root has suffered much from earache, his last trouble along this line being as recent as two years ago. This summer he noticed that he was gradually becoming deaf; and, on going to a specialist who had cared for him in the past, he found that the continued inflammation had finally caused an accumulation of pus in the inner ear, thus necessitating what is known in surgery as a "radical mastoid" operation. This was successfully performed on Monday, September 8.

Mr. Root was able to leave the hospital on September 17, but will have to continue treatment for some weeks to come. Fear of any complication now being remote, there is every reason for a complete recovery. It is a strange coincidence that this same trouble is what caused the early death of that able apicultural writer and authority, W. Z. Hutchinson, the founder and editor of The Beekeepers' Review.

Later.—Mr. Root is back in his office and says he is feeling fine.—Gleanings in Bee Culture.

LEGAL SERVICE DEPARTMENT

What Constitutes a Contract?

"Several weeks ago, in reply to an inquiry for honey, we stated to the party that we would ship him 5,000 pounds of honey, but no formal contract signed by either was drawn up, nor was any date of shipment agreed to.

Now we have advised the party that we do not care to send the honey, inasmuch as we want to feed it back to colonies of bees that are short of stores.

This party now threatens to sue us for damages for the full amount of the honey. As we see, this party is always ready to sue somebody if the slightest chance is given.

Previous to this we have been told by this party in letters over his own signature that he is not a beekeeper; that he merely buys honey as cheaply as he can, and sells it at a profit, perhaps from 20 to 40 per cent. However, at the same time he tells his customers that he is the producer of the honey, or at least he gives his customers to understand that he is the producer of this honey, and they purchase the product on this basis.

In one instance of correspondence he says: "A good bluff successfully conducted, is the battle half won."

Furthermore, he says: "All I have is a mail box, and must keep up my reputation and guarantee by demanding and delivering good products."

Realizing that this party carries on this sort of business, we decided that we would not send him any more honey. We did send him some honey two years ago, before we found out his methods.

Please advise us whether or not anyone has the right to sell honey by such pretenses.

If this party sues us for damages in not sending the honey, would we have grounds for a counter-suit? Possibly your legal department can advise us."

Wisconsin.

A proposal by letter to deliver honey, whether voluntary or in response to an invitation or inquiry, if accepted according to its terms, constitutes a contract.

The acceptance, to complete the contract must be made within a reasonable time, and must be unconditional. If the conditions of the proposal are varied in the acceptance, then they must be consented to by the proposing party.

The proposal must be sufficiently definite to identify the parties and the subject matter, and sufficiently specific in regard to the price and other terms of sale to satisfy the law of sales in general, in regard to these particulars.

Usually, where the time for performance of any act is not specified in the contract or proposal, the law will imply that a reasonable time under the circumstances is intended by the parties and the contract will not fail for that omission. So also, unless terms of credit are specified, the law will imply that the transaction is to be on a cash basis.

The fact that the proposed purchaser is engaged in disreputable or illegal business will not avoid a contract for the purchase of goods by him or to him. If, however, it could be shown that such purchaser intends by such purchase to defraud the seller or to use the goods of the particular purchase to further a general scheme to defraud whomsoever he may, the rule might be otherwise.

Under the late laws against what is commonly called "profiteering," it is possible that a contract can be avoided by showing that the purchaser intends to create a scarcity of the article on the market, or otherwise unlawfully influence prices. Precedents along this line are lacking in authority, however, and the point is not settled.

In general, the measure of damage for failure to perform a contract of sale of a marketable commodity is the difference between the contract price and the market price of the article. If the seller refuses to deliver according to the terms of his contract, the buyer may purchase at a higher price in the open market and hold his seller for the difference, if any, between what he paid and what he should have paid under his contract. On the other hand, if the buyer refuses to accept the property and pay the price of the contract, upon tender of delivery within the contract time at the contract place of delivery, the seller may sell on the open market and hold the buyer under his contract for the difference.

It is quite a common experience that this difference is less than the price of a law suit, even to the winner.

Questions as to whether particular correspondence constitutes a contract and whether such a contract is enforceable, and the like, must be measured largely by the laws of the locality of the controversy, and one should not proceed to the point of litigation without the advice of competent legal counsel.

As a general proposition it is advisable to live squarely up to the terms of a contract or agreement of any kind, whatever the cost, if it can be done. Losses suffered and sacrifices made in this way generally measure less than the loss of confidence and self-respect consequent upon a technical evasion.

The keeping of the contracts is encouraged by the law, for the stability of commerce depends largely thereon. The courts are apt to look with disfavor upon a litigant who would avoid the terms of a clear agreement to sell and deliver. Even where, without the fault of the seller, the goods of the contract are destroyed before delivery, the seller may be held in damages for failure to deliver unless provision is made against such a contingency in the contract.

BEEKEEPING FOR WOMEN

Conducted by Miss Emma M. Wilson, Marengo, Ill.

A Strong Colony

I have a hive of bees that will not swarm. The hive is running over with bees. I have given them a 2-story hive and two supers, and the whole thing is full. Can you tell me what to do with it? I am new to the business and can't understand what is wrong.

WISCONSIN.

You have given the colony a two-story hive and two supers, in all of which the bees are presumed to be working, and you wonder why they do not swarm. It is not hard to imagine those bees saying: "What a kind mistress we have! Other colonies are forced to swarm because so crowded for room, but our mistress has given us all the room we need, so we are saved all the bother of swarming." If you had left them with one story and one super, very likely they would have swarmed. There is a possibility, too, that the character of the bees has something to do with the case, for some colonies are more given to swarming than others. At any rate, most beekeepers would feel thankful to have bees like such a colony, quite willing to do without swarming.

Value of Plant, Etc.

How would you go about setting a value on your plant? How much would you allow for strong, medium and weak colonies? How much for nuclei, old hives, equipment? Would you go by what you paid or what you could sell for? What is the best way to clean an extractor, and how frequently should it be done? I wish Miss Wilson would discuss this subject quite fully.

NEW JERSEY.

Your question as to valuation of a bee plant is one not easily answered. Perhaps for purposes of declaring a dividend on the investment the right thing would be to count the actual cost. But how figure on nuclei, etc., that you have not bought? Suppose you have a colony with bees enough to cover well 8 or 10 frames, another

with enough for 4 frames, and a third with enough for 2 frames. If the time was spring, it is possible the second might be worth three-fourths as much as the first, and the third a third as much as the first. But if it were late fall the second might be worth a third as much as the first, and the third only a tenth. Ignorance must be the excuse for not giving a more satisfactory answer, and also for making no attempt to answer as to equipment.

To clean out an extractor the right kind of a brush is important. A dish mop with a long handle will do, but the one in use here is much better. It was gotten originally for cleaning out glass fruit jars. The brush, handle and all, is about 20 inches long, the brush part being 8 inches long, round and made of bristles. The long handle allows one to reach to the bottom of the extractor, and the brush is small enough in diameter to go anywhere around or inside the baskets. As soon as extracting is over, wash the extractor thoroughly with cold water, using the brush to get off all the bits of wax. Then scald with boiling water, again using the brush. Drain off the water and set in the sun to dry. Cover with heavy muslin cover to keep out dust, and it is all ready to use the next time it is wanted. The one washing at the close of the season is enough here, if the extractor is kept perfectly covered between extractings.

Cellar Wintering

I have been reading about Dr. Miller in the American Magazine. I'll soon be 16, but I've already decided what I'm going to do when I'm grown, and that is to raise horses, hogs and bees. So I was naturally very much interested in what was said concerning bees. I suppose by this time you are wondering what I want. Well, it's this: It mentions that bees cannot stand cold weather. So you place them in the cellar and heat it artificially. What temperature do you heat this place? You see when I start out I want to profit by what's been found out before me. You would laugh if you could see the amount of stuff I have collected. But I hope to put it to good use soon.

HELEN COULSON.

Very careful experiments by Dr. Phillips, the man in charge of the interests of beekeepers at Washington, have shown that a temperature of about 57 degrees in the hive is what the bees like best for good wintering. Of course, one cannot always keep the temperature of a cellar at a given point, and there are a good many cellars where it sometimes reaches the freezing point. That will do if it is only occasionally and for a short time. But a continued freezing temperature would not do at all. Some means should be used to keep the temperature not below 50 degrees, although bees have wintered well at 45.

Instead of having to keep the cellar warm enough, the effort may be to keep it cool enough, if there is a furnace in the cellar. Then in some way enough cool air must be let into the cellar, without letting in any light, to keep the temperature somewere from 50 to 55, perhaps occasionally running up to 60.

Now, if you think you know just how to run a bee cellar successfully, it may be as well to tell you that as far south as you are you should hardly winter bees in a cellar at all. At Hamilton, Ill., the home of the American Bee Journal, the Dadants have decided it is better to winter bees outdoors. They are a little north of the parallel of 40 degrees. You are a little south of it. So it's pretty plainly outdoors for your bees.

You are very wise to read up in advance about bees, and you should have Dadant's Langstroth or some other good text-book to study. Then, as soon as you can get them, start in with not more than two colonies of bees to practice with.

Ants—Bees Not Working

On a super I noticed a number of ants between outside and inside cover, also that the bees had completely covered the little square space in inside cover, which is screen wire, with propolis. I removed that, thinking it would give them more air. Did I do wrong? Do you think they had filled the screen with propolis to keep the ants out?

I looked at the bees again, July 29, expecting to find the super filled or at least find them busy in it, but to my surprise they were not working at all.

Would the ants hinder from working? Could it be that they have no queen?

Where can I obtain a good breeding queen, and which stock would you advice, the three-banded or the Golden Italians.

What is the value of an apiary of about 100 colonies of Italians and hybrids in 10-frame hives and an extra hive for each? The colonies are mostly all strong. Would like to have your recipe for queen cage candy. KANSAS.

You are referred to the advertisements of the American Bee Journal for obtaining good queens, as all of them are supposed to be reliable. The three-banded Italians are generally preferred.

The question as to what you can realize from an apiary of 100 colonies, is one that no one can really answer. It is a good deal as is the case with almost any business that can be mentioned. Some merchants make a fortune, some make a failure. Something depends on the locality. One location may be good and another poor, so that the same beekeeper would make three times as much in one location as in another. Very much depends on the individual. One of experience may do well where a green hand would fail. A beekeeper full of energy may do three times as well as a lazy one. It is a possibility— a possibility, mind you,—that an able beekeeper in a good year might average 200 pounds from each of 100 colonies. If he should sell that honey at 25 cents a pound he would get $5000 for his crop. Then it is possible that the harvest might be an entire failure the next year, leaving the beekeeper out of pocket the amount he would have to pay for feed.

Now after thus evading any direct answer so far, it may be well to give a quotation from Productive Beekeeping, by Frank C. Pellett. The experienced and able editor of that book says, page 17: "After gathering the average results from a number of beekeepers who have kept bees for many years, it seems safe to place the average return in the average locality at five dollars per colony in the hands of expert beekeeper." That, of course, would make $500 from 100 colonies. But at the high prices of the last two years that figure might be doubled.

To make queen candy, take best quality of extracted honey; heat but not boil, and stir into it all the pulverized white sugar (not confectioner's sugar with starch in it) it will take; then work in all the sugar you can by kneading with the hands. Let stand two or three days, and again knead in all the sugar you can.

DR. MILLER'S ANSWERS

Doctor Miller to Have a Rest

Readers of this department will please note that Doctor Miller is not as well as usual and refrain from sending letters direct to him for the present. The editors will do their best to answer such questions as are sent to the American Bee Journal until such time as Dr. Miller is able to resume his work. Although it will be a disappointment to many of our readers to find their questions unanswered by the good Doctor, we must remember that he is eighty-eight years of age, and few men have been able to carry on their work without interruption to such a ripe old age. He is certainly entitled to a vacation, and we are hopeful that he will soon be quite himself again.

All questions to be answered should be mailed direct to this office until further notice.

Stings

I had a horse that got into my apiary and got stung very badly and died. What could I have done for treatment in this case. Is there anything I could have used to ease the pain? NEW JERSEY.

ANSWER.—I'm afraid I cannot help you much. The first thing, of course, is to get the horse away from the bees, preferably into a dark stable. It might be worth while to scrape off the bees with a curry-comb to get rid of some bees that are burrowing in the hair but have not yet stung. I have read of

covering the horse with a very wet sheet to ease the pain, which at least would do no harm.

Swarm Control

What do you think of the plan of swarm control outlined by F. R. Smythe, of Cincinnatti, Ohio, in the August issue of the American Bee Journal? It has occurred to me that the bees would raise a young queen in the side hive, or start queen-cells, and those in the present hive would swarm out with the old queen. Do you think there is any advantage in this plan over leaving the two hive-bodies one on top of the other? IOWA.

ANSWER.—I find it difficult to understand the article in question found on page 266 of the August number. I think, however, that the main thing is that every 10 to 14 days the brood is taken from the brood-chamber and put into an adjoining hive, there being communication between the hives, the removed combs being replaced by combs that contain no unsealed brood. In effect this is the same as using the Demaree plan every 10 to 14 days, and should be effective in preventing swarming. The only question is whether it is easier to have this hive-body at the side or on top, and unless it can be shown to be easier having it at the side, there can hardly be any advantage in the proposed change. Cells would no doubt be started, as you suggest, but there might be no swarming. At any rate the cells could be killed at each change.

Queens—Hives—Kodaks

1. Do you advise me to breed from a hybrid queen whose progeny works on red clover after a wet spell when the corolla tubes are long? Her bees also gathered surplus last year when the others almost starved.

2. Which hive would you prefer the 10-frame story and a half hive, or the 13-frame hive, run for extracted honey?

3. How do you fasten queen-cells to a nursery frame?

4. I am thinking about buying a kodak. What kind do you advise me to get for bee pictures?

5. What was the number of the kodak used for pictures in "Fifty Years Among the Bees?"

6. How were Figs. 48, 49 and 52 taken? Did you have to use a flashlight? VIRGINIA.

ANSWERS.—1. If you have much red clover it might be well to breed partly, at least, from the red-clover queen, even though she be hybrid.

2. Hard to say; perhaps the 13-frame.

3. Just lay the cell on its side in the compartment, and it will be all right.

4. The Eastman kodak A 1 does good work, and there may be others just as good.

5. It was Kodak A 1. I think is cost $12, but would be higher now.

6. No, those were time exposures.

Feeding

When feeding bees warm sugar (cane) syrup in proper proportions, immediately after feeding, a good many dead bees are carried from the hive. In pressing these between the fingers they disgorge the syrup they have eaten. I am using the Alexander feeder and I am feeding my bees in daytime. Up to date I have found no solution. MICHIGAN.

ANSWER.—I think the thing you mention is more common than generally supposed, and I don't know how to account for it. It would seem that there should be no quarreling among the bees of the same colony working upon feed to which no other bees have access, yet I know it sometimes happens, without knowing why.

Increase

As my bees had no inclination to swarm this year, I would like to make increase the next season and have been wondering if following plan would be safe, or if I would only be sacrificing queens:

1. Divide strong colony about the 20th of May, raising half above (5 frames) over excluder, putting sheet over the lower five frames of brood, completing isolation as much as possible without interfering with free intercourse with above super, to which I would introduce a laying queen.

2. Would both stories build up in time for clover flow, which begins about July 1? CANADA.

ANSWER.—If understand correctly, you mean to let the two parts remain separated by the excluder till clover harvest. I'm afraid in too many cases you would find one of the queens missing.

Bees Leave Hive

I had a colony of black bees which I Italianized. Later the queen and all the bees left the hive, leaving behind both brood and eggs. Can you tell me what made them leave and will this hive of combs do for bees again next spring? NORTH CAROLINA.

ANSWER.—It is possible the bees deserted the hive because lacking honey or pollen, or both. This sometimes happens.

The combs will be all right for a swarm next year provided "worms" do not destroy them in the meantime. But you cannot depend on keeping moths out by keeping the hive closed, for the eggs are there already. Fumigate the combs, and then again two weeks later, and then you may trust to keeping the hive closed tight.

Balling Queens

In the latter days of July as I was carrying two frames of brood which I had cut out of an old box hive, to give to the colony which I had transferred. I noticed a swarm passing over. I used a method I had found effective before and got them to cluster on a small peach tree about eight feet from the ground. Using the two frames of brood in the hive to hold them I proceeded to get them into their new quarters. The queen did not go into the hive so I placed her on the frames. Immediately she was balled. I released her from the balling bees and dipped her in honey and placed her on one of the frames of brood and closed the hive. She was missing the next day, and in due time five cells were capped over on the transferred brood. They killed that queen and I introduced another and the colony will go into winter in good shape. It was evidently an absconding swarm, as the queen was a layer. Inspectors were busy treating for American foulbrood and swarms were busy moving out. The puzzler to me is, why did they ball the queen. An answer in the Am rican Bee Journal will be appreciated. KANSAS.

ANSWER.—You placed the queen on the frames, and in doing so you may have given her a strange odor to which the bees objected. Maybe that's the right answer and maybe it isn't.

Moving Bees

I have a hive of bees which is now within about fifteen feet of the line which will have to be traversed by horses in doing some excavating which I contemplate doing early next spring. The bees are Italian bees. Will there be danger of the horses working so close to the hive? There is another place one hundred feet away to which I can move the hive if necessary. Would it not be best to move the hive during the winter season by taking it bodily from its present place? ILLINOIS.

ANSWER.—There would be danger of the bees stinging the horses, especially if they face towards the passage of the team and there are no obstructions, such as trees or brush, in the way. You might build a tight board fence in front of the hive. But it would probably be preferable to move them as you suggest. Better do it soon, so they may learn the new place before cold weather. If you move them on a cold day, there is a possibility of many of them being lost at their first flight. Move them soon, in the morning of a good day for them to fly. Disturb them thoroughly, so they may know that something is wrong. When you release them, put a slanting board in front of the entrance so that they may notice at once that something has been changed. They will then be more apt to recognize the place and come back to it. If they are thoroughly disturbed, very few will fail to return to the new place, since they will have taken notice of the change. More bees are lost, likely, when the hive is moved 100 feet or less than when moved several miles, out of the range of their flight.

Foulbrood

1 My dad has cut down many bee-trees, and he says he has found them and their brood all healthy. Now, how is it, that when you take the bees out of the trees and put them into modern up-to-date hives, they take the disease?

2. Do you think putting the diseased hives into hot lime water would kill the disease? CALIFORNIA.

ANSWERS.—1. If your dad had transferred the bees from the log to the movable-frame hive fifty years ago and had kept them without a trace of disease until two or three years ago, would he still accuse the movable-frame hive of being the cause of the disease?

2. There is a much quicker way to treat the hives than a bath of quicklime; it is to paint the inside of them with a little coal oil and set fire to them, allowing them to burn only a few seconds. Still better is to borrow a gasoline torch from a tinner and throw a blaze on every part of the wood, so as to singe it. But lime will probably do, if you prefer that way.

Moths

Will you please tell me what I can do about moths cutting up my drawn comb? I extracted about the first of September and put my supers with drawn comb in storeroom upstairs, in my house. Nothing else in the room. A week later I looked them over and found some big and some small wax moths cutting up my drawn combs. I killed as many as I could find. MINNESOTA.

ANSWER.—Either use brimstone wicks, that you can buy from the druggist, and burn a piece about 3 inches each way, in a crock or clay vessel, under the combs, in a closed room. This should kill not only the moths, but the flies in the room. If the room is too large you should use more brimstone. Or you can also use carbon-disulphide, but this explodes if you bring a light near it. Dip a piece of rag in carbon-disulphide and lay it over the combs, closing up the super. It will evaporate and kill the moths. You should repeat the dose in a couple of weeks to kill the hatched eggs.

Wiring—Hive Roofs

1. This season I wired a few frames (Dadant) with the regular number of horizontal wires and with one perpendicular wire. This wire passes through a small hole in the upper bar and is secured to a small nail beside the hole. This wire makes a turn around each horizontal wire and is then fastened to the lower bar. This seems to wholly prevent foundation from sagging down. What is wrong with this simple scheme? I can't see what it is, but I know there is something, or else you and the Dadants would use it.

2. I would like to ask the Dadants what they would think about using surplus foundation in the extracting frames and wiring the frames? If my bees use any of the wax that is in light brood foundation in making the cells it is such a small amount as to be unnoticeable. I have scraped the cells off of some combs that were built on light brood and the foundation looks just the same as when put in the frame, and I think it would weigh as much, or more.

3. In the back of Dadant's catalog, in that picture of one of your out-yards, what are those things laying on top of each hive? WISCONSIN.

ANSWERS.—1. That method is all right. Each

man has his own way, and yours is good.

2. We have never used thin surplus foundation in extracting frames, but it would probably do if it is wired. The electric wiring tool would be excellent for this.

3. Roofs, to protect the center of the cap from the sun and rain. They are made of rough lumber and those in the picture are rather smaller than the average.

Miscellaneous

1. Do you believe that bees produce wax in the average clover flow in an involuntary manner?

2. If one has two-thirds of the necessary combs to hold his crop, how much honey will it cost him to draw the other third? Extracted honey being produced and full sheets used.

3. Do you know of any objection to the use of sappy yellow pine for shallow supers and frames? Some of the sap yellow pine being lighter than cyprus, and nearly as light as white pine.

4. Do you believe that one pound of sugar syrup, made two to one, is the equivalent of one poun of good honey for winter food?

5. Do you believe that well-ripened clover honey should stand a few days in open tanks before being canned and sealed? I had some sour, and a beekeeper of long experience said it was because it had been sealed in cans within a few hours after being extracted. (I believe he is wrong.) OHIO.

ANSWERS.—1. It is quite probable that bees produce more or less wax involuntarily, when they are compelled to remain filled with honey for days. Field bees produce but little wax if they are able to unload their honey sac at each trip.

2. I don't know. That is a question which is more or less speculative, as much depends upon crop conditions.

3. Sappy yellow pine is all right, where it can be used without splitting and where it is not exposed to moisture.

4. Yes, very nearly.

5. If it is *well-ripened* there is no need of its being kept in open tanks. But was this well-ripened? If not, standing in an open tank in a warm, dry spot, would have tended to improve it.

Clipping Queens

1. Would you advise cropping a queen's wings to prevent her absconding with a swarm where the apiarist has to be absent part of the time? If so, would you crop one or both wings, and how much would you clip off.

2. Would her wings ever grow back normal again?

3. Wouldn't the queen, after having her wings cropped, crawl out on the ground with her swarm, and would she be likely to enter an empty hive if one was placed 6 or 8 feet away, and in front of the parenthive?

4. On September 11 I hived a nice swarm of bees. Do you think they will make enough honey to sustain them till spring? MISSOURI.

ANSWERS.—1 Yes. One wing is sufficient.

2. No, they never grow again.

3. Usually when the queen is on the ground, a number of bees accompany her and try to protect her. She might enter an empty hive, but would not be likely to do so, unless some of her bees directed her in that direction.

4. That is a question that you are better able than anyone else to answer. Examine that colony, and if it does not have enough, feed it.

Wintering—Large Hives

1. I intend to put my bees in good double-walled hives. Then put them in a shed with a roof, and north and west wall, to protect them from cold winds. Could the hives be packed row upon row upwards?

2. Would this be enough protection, considering my location, it being Milwaukee?

3. I have read articles endorsing the Jumbo Langstroth pattern. Now, I have spoken to a well-known Wisconsin beekeeper about them in regard to swarming, etc, stimulating breeding. He claims that unless a colony is quite strong in the spring, they will not breed up as fast in the Jumbo hive as in a 10-frame standard hive (regular depth.)

4. What feeder do you advise for fall feeding, for winter stores? WISCONSIN.

ANSWERS.—1. Your proposed method looks good. You can pack your bees row upon row, but the more bees you will put in a small space, moving them from their summer stand, the more danger there will be of "drifting," that is of the bees of weak colonies joining the strong colonies. The reason is that, when they are moved they have to learn their location again, and in the excitement of the change a great many young bees go where the biggest noise is made.

2. I think so.

3. Your advisor is right. But it is probable that colonies in large hives will be stronger to begin with, in the spring, than those in smaller hives. In that case they will breed as fast or faster in the larger hives.

4. Use the Miller feeder, or any of the inverted can feeders over the brood combs.

Starter-Cells, Etc.

1. Do bees generally build satisfactory combs in Jumbo frames with 1-inch comb foundation starters?

2. Do you think a cellar under a dwelling, brick walls, cemented on the inside and bottom, perfectly dry, temperature from 55 in early part and 40 in severest part of winter, a good place to winter bees?

3. Would packing do much good where temperature may go to 12 below zero for a few days; if so, how much would be satisfactory?

4. Is lispedeza (Japan clover) any good as a honey plant?

5. Do you think three-eighths of an inch space between frames sufficient for wintering, or would it be better to remove one frame to give room for clustering, or remove one and spread the rest farther apart? KANSAS.

ANSWERS.—1. No; no matter what kind of frame be in use, there will almost certainly be too much drone-comb with a 1-inch starter.

2. They may do very well if that 40 degrees doesn't hold too long at a time.

3. Yes; 3 or 4 inches of packing would be a good thing, but a good cellar would probably be better.

4. I think so, but have had no experience with it.

5. That depends. If top-bars are 1⅛ wide, then ⅞-inch space between them is enough. In general, if there is only a distance of 1⅛ inches from center to center of frames, then it may be better to arrange in some way for wider spacing.

Shade Vs. Sunshine

I have been told by some beemen that it is better for bees to be out of the sunshine in a shady place; that this was the best method; but I see that most prominent beemen have their bees out in the sunshine. Will you please advise me which is the best? ALABAMA.

ANSWER.—I wouldn't like to be positive about it. I have been under the impression that most beekeepers preferred the shade. In this locality, at least, the bees seem more comfortable in the shade, and I'm sure the shade is more comfortable for the beekeeper when he is working at them.

Western New York Beekeepers Meet

The Western New York Honey Producers' Association will meet at Genessee Hotel, in Buffalo, on Friday and Saturday, November 14 and 15. R. F. Holterman, of Ontario; George H. Rae, Cornell University, and E. Victor Underwood, of Erie Farm Bureau, are among the speakers already secured.

Iowa Convention

As we go to press announcement is received that the annual convention of the Iowa Beekeepers' Association will be held at Des Moines on Monday and Tuesday, November 10-11. Program had not been completed at time announcement was received, but full information, together with program, will be sent to all who apply to F. B. Paddock, State Apiarist, Ames. Iowa.

New Bee Inspector for Arizona

Arizona has a new bee inspector, appointed by Governor Thomas E. Campbell. The new man is Earl L. Matteson, of Benson, who succeeds Peter Benson, of Buckeye, resigned. Matteson is one of the biggest beemen of the State himself, being interested in the business with Charles A. Goetz.

There is still pending in the courts a pair of suits against the State Auditor for the collection of the salaries of the two last State Bee Inspectors, each of whom contend that he is entitled to the money for his salary, when there is only enough money in the fund to pay one of them.—Phoenix Republican.

Bee Club Organized

With the organization of the Liberty Bell Bee Club in Pasco, Wash., there has been launched what is intended to become a statewide and perhaps a national institution. The corporation is planned to increase the production of honey and stimulate the saving habit and to provide an educational fund to assist worthy students in need of help in securing a higher education.

The mother apiary of the organization will be started in Pasco, the work being under the supervision of L. S. Crossland. Plans call for the raising of $2,500 capital in this country, and Mr. Crossland will guarantee 8 per cent return on the money invested. As soon as the stock has been sold other apiaries will be established at other points and the capital stock increased, eventually spreading to all parts of the State. It is provided that one-half of all earnings over and above the initial dividend shall be paid into an educational fund to be controlled and used in accordance with the by-laws of the organization.

Spokane, Wash.

Beekeepers' Exhibit at the Chenango County Agricultural Fair

Realizing the fact that to keep the price of honey where it rightly belongs, so that the producer may secure a fair return for his labor and interest on the money invested for bees and equipment, we must increase the demand by increasing consumption, the place to start to advocate the more general use of honey is at home, so the Chenango County Beekeepers' Society staged one of the most interesting features of the Chenango County Agricultural Fair at Norwich, N. Y., August 26, 27, 28 and 29, under the direction and supervision of the society.

There was a large display of bees in observatory hives, comb and extracted honey, beeswax, cakes, cookies and doughnuts made with honey; berries and fruits preserved with honey; jams, jellies and marmalades made with honey, and a good display of apiary appliances.

The Secretary was on the job each day with a committee to answer questions, talk honey and hand out samples.

We had on display several frames of honey, that were contributed by the different members of the society, to be extracted and handed out as samples during the fair.

At different periods we would demonstrate how the combs were uncapped and the honey thrown from the combs with the extractor. The combs were displayed before and after extracting. At the same time we would explain the difference between comb and extracted honey, also the difference between extracted and strained honey.

The honey, after being extracted, was strained through cheese cloth into a specially prepared can with a small gate, the samples of honey were handed out by placing small round crackers on a small platter and about a half a teaspoon of honey deposited on each cracker. This made a very suitable and delicious sample. As fast as the samples were handed out we uncapped and extracted a new supply.

During the four days of the fair we handed out about 150 pounds of honey as samples. One day we handed out about 2,000 of Dr. Miller's leaflets, "Food Value of Honey."

We did not go to the fair to sell honey, as this season's crop in this county is nearly exhausted; we went to advertise.

One exhibitor showed a 5-pound tin pail and a 1-pound glass jar, each container costing about the same price.

He was boosting the large package claiming that it was a good family size and that it did not cost any more to sell than a 1-pound glass jar, and the consumer got the benefit of the lower price. The tin had another advantage over the glass, as there was no breakage in handling, shipping or liquefying.

Thursday was beekeepers' day and there were many practical demonstrations for the benefit of beekeepers.

While this is a county fair, it was surprising how many were present from other States, and how much interest was displayed in our exhibit and talks on honey and its uses. It was also surprising how few ever heard of extracted honey or knew how it was produced.

We feel that we have given honey a boost and have done some good advertising that will be of great benefit in helping the sale of honey in this locality, and that it will be the means of placing honey on the tables of many families that have always thought of honey as a luxury, instead of a healthful food.

CHENANGO COUNTY BEEKEEPERS' SOCIETY.

Illinois Convention

Illinois beekeepers will meet at Springfield on December 9 and 10. Headquarters will be at the Leland Hotel. The program will be sent direct from the Secretary, J. A. Stone.

Ontario Beekeepers to Meet

The Ontario convention will be held at the Carlsrite Hotel, in Toronto, on November 11, 12 and 13. The fruit and flower exhibition will be held at the same time, and an exhibit of honey will be combined, as in the past. An excellent program is in prospect.

Eastern New York Meeting

The Eastern New York Beekeepers' Association will hold their twelfth annual convention in the Supervisors' room in the Albany County Court House, at Albany, N. Y., on Thursday, Nov. 20, 1919.

Prof. Geo. H. Rae, Extension Specialist in Apiculture, and other live beekeepers are expected to be present and address the meetings.

Sessions at 9:30 a. m. and 1 p. m.

STEPHEN DAVENPORT, Sec'y.
Indian Fields, N. Y.

CLASSIFIED DEPARTMENT.

Advertisements in this department will be inserted for three cents per word, with no discounts. No classified advertisement accepted for less than 35 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 20th of the month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

BEES AND QUEENS

CASH for extracted honey, white or amber, in 5 or 10-lb. cans. Send sample and say price.
T. Lang, 1573 N. Halsted St., Chicago, Ill.

BEES BY THE POUND, ALSO QUEENS—Booking orders now. Free circular gives prices, etc. See larger add elsewhere.
Nueces County Apiaries, Calallen, Texas,
E. B. Ault, Prop.

THE AMERICAN BEE JOURNAL is prepared to furnish printing for beekeepers. High quality, prompt service and satisfaction. Our shop is in charge of a man who specializes in printing for the honey producer. Send for our catalog of honey labels, stationery, etc.
American Bee Journal, Hamilton, Ill.

BEES AND QUEENS from my New Jersey apiary. J. H. M. Cook,
1Atf 84 Cortland St., New York City.

FOR SALE—Italian bees and queens (the kind that fill from 2 to 6 supers). Bees, $12 a colony; queens, $2 each, 6 for $11. Queens go by mail; bees by express. Order direct from this ad. Miss Lulu Goodwin,
Mankato, Minn.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you desire. They are great honey gatherers, beautiful and gentle. Virgin, $1; mated, $2. C. W. Phelps & Son,
3 Wilcox St., Binghamton, N. Y.

GOLDENS that are true to name. Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75. Garden City Apiaries,
San Jose, Calif.

FOR SALE—Leather colored Italian queens, tested, June 1, $1.50; untested, $1.25; $13 a dozen. A. W Yates,
15 Chapman St., Hartford, Conn.

"SHE SUITS ME" Italian queens, $1.15 each, from May 15 to October 15; 10 or more, $1 each. Allen Latham, Norwichtown, Conn.

THREE-BANDED ITALIANS ONLY—Untested queens, 1, $1.25; 6, $6.50; 12, $11.50; 50, $40; 100, $75 H. G. Dunn,
The Willows, San Jose, Calif.

FOR SALE—Pure 3-banded Italian queens, as good as you can buy with money, from June 1 to September 1.
J. F. Diemer, Liberty, Mo.

FOR SALE—100 colonies of bees, most all in new hives with Hoffman frames. Plenty of stores. Address James Johnson,
Box 265, Pocahontas, Ark.

LEATHER and all dark colored Italian queens, when we have them, mated, $1 each. These queens will include all that are not up to the standard in our goldens, but will be good utility stock. C. W. Phelps & Son,
No. 3 Wilcox St., Binghamton, N. Y.

HONEY AND BEESWAX

WANTED—To buy honey, comb or extracted State price, quality and how packed. Address Paul Thomae, 1019 Ninth St., Milwaukee, Wis.

FOR SALE—New crop clover honey; put up in new 60-lb cans, 2 to the case, 25c per pound, f. o. b. here.
W. B. Crane, McComb, O.

FOR SALE—One car fine alfalfa-sweet clover extracted honey. Write me
S. J. Harris, Olathe, Colo.

FOR SALE—40 cases fine clover honey in new 60-lb cans.
Edw. A. Winkler, Joliet, Ill.

FOR SALE—200 cases comb honey in 4¼ in. square sections, 24 sections to the case, and 6 cases to the carrier; one-half white, the balance buckwheat; all for prompt shipment. Give me your prices at once.
G. L. Allen, Wysox, Pa.

FOR SALE—80,000 lbs. of very fine alfalfa-clover honey in new 60-lb cans; will sell part or all of it in car lot. If interested send 25c for sample; it will be applied on your order. Also, 20,000 lbs in 5 and 10-lb. pails, cased. Will mix a car for you.
S. F. Lawrence, Hardin, Mont.

FOR SALE—Clover and buckwheat honey in 60-lb cans, 2 per case.
Bert Smith, Romulus, N. Y.

WRITE for shipping tags and our prices for rendering your old combs, cappings, etc. We guarantee a first-class job.
The Deroy Taylor Co., Newark, N. Y.

FOR SALE—Clover and buckwheat honey in any style container (glass or tin). Let us quote you. The Deroy Taylor Co.,
Newark, N. Y.

FOR SALE—Light amber honey in new 60-lb. cans. Van Wyngarden Bros., Hebron, Ind.

FOR SALE—New crop clover extracted honey, two 60-pound cans to case, 25c per pound. Buckwheat and clover mixed, about half and half, 20c per pound.
H. G. Quirin, Bellevue, Ohio.

FOR SALE—4,000 lbs. of extracted honey, mesquite blend, in new 60-lb. cans, two cans to case. Also, 1,200 lbs. same as above in half-gal. and gal. cans. Best ofler takes it. F. Q. B. Three Rivers, Tex.
Chas. Heim & Sons.

OUR CROP OF HONEY is now ready for shipment. It is a good grade white clover with a very small trace of basswood, almost water white. It is put up in new 60-lb. tin cans, two to the case. This honey was all produced by ourselves above queen-excluders, in nice white combs. Then combs were provided so that no honey was taken off until after the season, when it was thoroughly cured by the bees. It costs more to raise a crop of honey this way, as we do not get as much per colony, so we have to have a little more money for this fancy article than the ordinary honey on the market. Try a small order and we feel sure you will buy no other.. We can furnish at the following prices, f. o. b. Northstar: one 60-lb. can $15.50; in cases of two cans, $30 a case, in any sized orders. The crop is short this year and will not last long at these prices. We feel quite sure that the price will not be any lower, so do not be disappointed by not ordering early if you are looking for honey as good as money can buy.
D. R. Townsend, Northstar, Mich.

FOR SALE—Extracted clover and buckwheat honey. Let us quote you.
The Forest Honey Co.,
2323 S. Woodstock St., Philadelphia, Pa.

WANTED—White clover or light extracted honey. Send sample; state how honey is put up and lowest cash price delivered at Monroe; also buy beeswax.
E. B. Rosa, Monroe, Wis.

WANTED—Comb and extracted honey; send sample of extracted and quote your best wholesale price f. o. b. your station, how packed, etc., in first letter. D. A. Davis,
216 Greenwood, Birmingham, Mich.

WE BUY HONEY AND BEESWAX—Give us your best price delivered New York. On comb honey state quantity, quality, size, weight per section and sections to a case. Extracted honey, quantity, quality, how packed, and send samples. Chas. Israel Bros. Co.,
486 Canal St., New York, N. Y.

WANTED—Honey, in light and amber grades. Send sample, stating quantity, how put up, and lowest cash price delivered in Spring Valley. Ed. Swenson, Spring Valley, Minn.

FOR SALE—15,000 pounds of fine clover and basswood honey. The best offer takes it if satisfactory. Chester E. Keister, Clarno, Wis.

WANTED—Comb, extracted honey and beeswax. R. A. Burnett & Co.,
6A12t 173 S. Water St. Chicago, Ill.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 6c a pound for wax rendering. Fred W. Muth Co.,
204 Walnut St., Cincinnati, Ohio.

FOR SALE

BEELINE Honey, nature's best wild flower blend; 20 lbs. $7.50.
Lorenzo Clark, Winona Minn

FOR SALE—60 perfect worker combs in Hoffman wired frames on full sheets of comb foundation, in 6 full depth supers; price $15. Ten supers for 10-frame hives, filled with section holders for 4¼x1⅞ sections, 50c each. Edwin Bevins, Leon, Iowa.

FOR SALE—Selling out bee supplies at 50 per cent less than present prices. Write for list. Hunkel Co., Milwaukee, Wis.

FOR SALE—Cedar or pine dove-tailed hives; also full line of supplies, including Dadant's foundation. Write for catalog.
A. E. Burdick, Sunnyside, Wash

FOR SALE—300 colonies bees, with complete equipment for extracted honey; no disease here. J. O. Hallman, Helena, Ga.

CLOSING OUT SALE—An opportunity to enter another line of business has presented itself and I have decided to retire from the queen and bee business. I have probably the best outfit in Louisiana for the queen and package business, located in 3 yards in Avoyelles Parish, the best known bee section in the State. We have a live Parish Beekeepers' Association, and a State Association has recently been organized. I offer 400 colonies Italian bees, 8-frame, 2 stories, first class. Portable power extracting outfit, engine and power saw, together with supplies of all kinds on hand. This is complete and going business, profitable and ready to work. Best quality, and the outfit represents 5 years of careful painstaking effort. Business now on book for spring delivery. Delightful climate. Price $3,000. I am solvent; no forced sale. Correspondence only with those who mean business is desired. No lease or share deal considered.
J. F. ARCHDEKIN,
Big Bend, La.

FOR SALE—200 new 10-frame cross style, reversible bottom-boards at 50 cents each; 200 new flat reversible covers at 60 cents each; 5,000 all-wood extracting frames at $5 per 100; 100 new Alexander feeders at 20 cents each; 150 Boardman feeders without cap or jar, at 12 cents each. All above goods are factory made and have never been used. I also have some 8 and 10-frame hives complete which space does not permit to mention here. Write
M. E. Eggers, Eau Claire, Wis.

BLACK SIBERIAN HARE—World's greatest rabbit for fur and meat. Write for information.
Siberian Fur Farm, Hamilton, Canada.

FOR SALE—Phot. of L. L. Langstroth, inventor of movable-frame hives, size 7x9; price, $1. American Bee Journal,
Hamilton, Ill.

FOR SALE—"Superior" Foundation (Weed process). Qualit and service unexcelled.
Superior Honey Co., Ogden, Utah.

WANTED

WANTED—To buy comb honey, either amber or white. Edw. A Winkler, Joliet, Ill.

WANTED—To buy small honey extractor.
E. D. Chandler, Casa Grande, Ariz.

WANTED—Iron mortar and pestle for cracking crockery for poultry. Address
G. R. Richardson, Princeton, Ill.

WANTED—Comb and extracted honey, light and amber and clover grades.
Robert Gilkinson,
1339 Dewey Ave., Rochester, N. Y.

WANTED—Man for comb-honey production; 12 months' work. State wages expected and experience. Sunnyside Apiaries,
Fromberg, Mont.

WANTED—Your old combs, cappings or slumgum to render into beeswax by our high steam pressure wax presses.
Dadant & Sons, Hamilton, Ill.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices.
Superior Honey Co., Ogden, Utah.

WANTED—I have a fine location in California and want a man to associate himself with me in the beekeeping business. I have the stock of bees and equipment here in Arizona; wish to ship all to a certain point in California this fall; have an attractive proposition to offer the right man that can invest in half interest in what I have. Tell your story in first letter.
J. B. Douglas, Box 1085, Tucson, Ariz.

SUPPLIES

FOR SALE—Good second-hand empty 60-lb. honey cans, two cans to the case, at 60c per case, f. o. b. Cincinnati; terms cash with order. C. H. W. Weber & Co.,
2146 Central Ave., Cincinnati, O.

MY FEEDER—Make 'em yourself. I tell you how. Won't rust. Sample and tool postpaid, 24c. Dr. Bonney, Buck Grove, Ia.

FOR SALE—Beehives and supers. Address
Thos. Cordner, Rt. 7, Sparta, Wis.

NEW HONEY CANS—Two 5-gallon cans in a cleated-end case, direct from the factory to you at $1.20 per case, f. o. b. your station.
Edw. A. Winkler, Joliet, Ill.

SEND us a list of goods wanted and will quote you lowest prices. We are the money-saving house. Price list free. Try us.
H. S. Duby & Son, St. Anne, Ill.

SITUATIONS

WANTED—Two experienced beemen for the season of 1920. One queen-breeder with experience, one with experience in handling bees. State age, number of years experience and wages. Also give references.
W. J. Forehand & Sons, Ft. Deposit, Ala.

MISCELLANEOUS

FOR SALE—Remington automatic rifle, 22 calibre, excellent condition, $25; used 3 months. Will take an extractor or bees in trade.
Thos. H. Cordner, Rt. 7, Sparta, Wis.

AMERICA'S UNIQUE PUBLICATION

The Youth's Companion prints week after week the best of everything that is worth while, and for every age. No other source will give your family what The Companion furnishes, or so much for the price—less than 5 cents a week.

The Companion creates an atmosphere of loyalty to the family and to the country, of unselfishness and high purpose. It inspires, it suggests, but always entertains. It makes actual, normal life fascinating, and never panders to the trashy or worthless or worse.

No family should miss the pleasure of reading the delightful serial stories by Elsie Singmaster, Capt. Theodore G. Roberts, and others, to be published during the next year. If you subscribe at once you will receive all the extras mentioned in the following offer:

New subscribers for 1920 will receive:
1. The Youth's Companion—52 issues in 1920.
2. All remaining weekly 1919 issues.
3. The Companion Home Calendar for 1920.
All the above for $2.50.
4. McCall's Magazine for 1920, $1.00—the monthly fashion authority. Both publications for only $2.95.

THE YOUTH'S COMPANION,
Commonwealth Ave., & St. Paul St., Boston, Mass.

New Subscriptions Received at this Office.

Seamless Paper Containers
THE MOST PRACTICAL AND ECONOMICAL CONTAINER FOR
Honey
Superior to any other single service container manufactured
Write for particulars and prices
THE SANITARY PAPER BOTTLE CO. Sandusky, Ohio 415 Water St.

I WANT to trade honey for a good-toned guitar. Must be in good order.
Dr. A. F. Bonney, Buck Grove, Iowa.

MAKE YOUR OWN FOUNDATION and earn money making foundation for others. The simple, easy way, machine and outfit; hand, $100; electric power, $350.
Grand Haven Pattern Works,
Grand Haven, Mich.

FOR SALE — California Wonder corn for seed. A new white dent; has averaged as high as six good ears per stalk. The greatest yields of any corn known. Order now. Price, 10 pounds, $3.50.
James McKee, Riverside, Calif.

THE DOMESTIC BEEKEEPER is published "wholly in the interest of the honey producer." It will help you to produce more honey, and then help you to sell it for the best price. Published monthly, $1 per year. Send for sample copy and list of liberal clubbing offers. Address The Domestic Beekeeper, Almont, Mich.

WANTED—Beeswax, old combs and cappings to render on shares. Will pay highest market price and buy your share of the beeswax.
F. J. Rettig & Sons, Wabash, Ind.

Statement of the Ownership, Management, Circulation, Etc., required by the Act of Congress of August 24, 1912, of **American Bee Journal,** published monthly at Hamilton, Illinois, for November, 1919:

STATE OF ILLINOIS, } ss.
COUNTY OF HANCOCK.

Before me, a Notary Public, in and for the State and County aforesaid, personally appeared V. M. Dadant, who having been duly sworn according to law, deposes and says that she is the Business Manager of the American Bee Journal, and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 443, Postal Laws and Regulations, printed on the reverse side of this form, to-wit:

1. That the names and addresses of the publisher, editor, associate editor, managing editor and business managers are:

Publisher, American Bee Journal, Hamilton, Ill.
Editor, C. P. Dadant, Hamilton, Ill.
Associate Editor, Frank C. Pellett, Hamilton, Ill.
Managing Editor, M. G. Dadant, Hamilton, Ill.
Business Manager, V. M. Dadant, Hamilton, Ill.

2. That the owners are:

C. P. Dadant, Hamilton, Ill.
H. C. Dadant, Hamilton, Ill.
V. M. Dadant, Hamilton, Ill.
Leon Saugier, Hamilton, Ill.
L. C. Dadant, Hamilton, Ill.
M. G. Dadant, Hamilton, Ill.
Jos. Saugier, Hamilton, Ill.

That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of the total amount of bonds, mortgages or other securities, are: None.

(Signed) VALENTINE DADANT.

Sworn to and subscribed before me this 16th day of October, 1919.
R. R. WALLACE Notary Public.
My commission expires September 21, 1921.

PAT. JULY 30, 1918

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Not Get the Best—
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FOR only the best pays. Remember, our goods are guaranteed to give you satisfaction. Your order receives prompt attention, and after it is discounted 3%—if it is received this month—it is sent to you by the shortest direct route. For we are situated in one of the best shipping centers in the West, and you can be assured that our Traffic Department will route your order to your particular advantage.

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KRETCHMER MFG. CO.

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BEES BY THE POUND

Booking orders now with 10 per cent down, balance just before shipping. For full remittance with order offer the following discounts: 5 per cent for October, 4 per cent for November, 3 per cent for December, 2 per cent for January. We have shipped for several seasons thousands of pounds all over the United States and Canada. Guarantee shipment to be made on time. Free Circular explains, also gives prices on Bees by Parcel Post, Nuclei, etc.

Prices F. O. B. here, by express.

1 pound package bees, $2.40 each; 25 or more, $2.16
2 pound package bees, $4.25 each; 25 or more $3.83
3 pound package bees, $6.25 each; 25 or more, $5.62
Add price of queen wanted when ordering bees

QUEENS

Untested, $1.50 each; 25 or more $1.35.
Tested, $2.50 each; 25 or more, $2.25
Select Tested, $3 each.

NUECES COUNTY APIARIES E. B. AULT, Prop. Calallen, Texas

Crop and Market Report

Compiled by M. G. Dadant

Since our last report other information on the crop has come that would tend to show that it is better than anticipated. According to the Government report it seems to be a little better than last year. The fall producing sections have reported very good honey crops in these localities, which has helped bring up the average.

HONEY PROSPECTS

A good fall crop usually indicates that the prospect for the next year will be good and this seems to be the rule over most parts of the country. Fall rains have tended to balance up the earlier drought during summer, although in many localities the clover still seems to be pretty well burned out and not showing much on the hills.

DEMAND FOR HONEY

The demand for honey continues good and should, in view of the shortage of sugar. This demand should continue strong at least until after the holidays, as it is doubtful whether the sugar shortage will be alleviated until later on during the early spring months.

We would suggest, however, that the parties who still have honey to sell get rid of a bulk of their honey before the first of the year, while prices and demand are strong. The candy manufacturers and many other manufacturers of sweets do not seem to be returning to honey as a substitute yet. Evidently such large manufacturers were well stocked ahead of time with supplies of sugar and are not requiring such large quantities of honey.

Of course, with the individual user the occasion is different. Many are buying honey because they cannot procure sugar at all. In most localities the effect of lack of local advertising is seen. Many parties wishing sweets are unable to get any and have not had honey placed before them in a sufficiently attractive manner to warrant their buying to any extent.

PRICES OF HONEY

In a wholesale way the prices of honey have gotten a little stiffer within the last month. Prices on the Pacific Coast, as quoted by commission merchants, now range from 1 to 2 cents per pound higher than during our last report. These prices are guaranteed against decline until November.

Although honey will remain in demand, we doubt whether there will be a large increase in price, and believe that a price of 20c for white extracted honey is not far below what is proper. In fact there are many lots still waiting buyers and which are offered from 17 to 19c per pound f. o. b. shipping point, which would make about 20c per pound f. o. b. the larger markets of the country.

SUGAR SHORTAGE ACUTE

Beekeepers in many localities are confronted by a serious situation in being unable to secure sugar to feed their bees. Since the lifting of the ban on sugar following the close of the war, the country has used far more sugar in a period of nine months than ever before in an entire year. The coming of prohibition is making many new demands for sweets of all kinds, which promises to be permanent. While this unusual demand promises a bright future for beekeeping, in that it tends to make higher prices for honey permanent, it has made it next to impossible for beekeepers to secure needed supplies for the coming winter.

The United States Sugar Equalization Board, 111 Wall Street, New York City, stood ready to supply the beekeepers, but were unable to do so, owing to the fact that they distributed sugar only in car lots.

An arrangement has recently been made whereby for all sugar used in territory east of a line between Pittsburg and Buffalo will be supplied with cane sugar, while all territory west of that line will take beet sugar. Beekeepers who live in New York State should write to George H. Rea, Extension Division, Cornell University, Ithaca, and state the amount required to feed for winter stores. Pennsylvania beekeepers should write to Prof. J. G. Sanders, Bureau of Plant Industry, Harrisburg, in similar manner. In these two States arrangements have been made to buy in car lots and distribute from convenient points. In other Eastern States the best the beekeepers can do is to organize and purchase car lots through the United States Sugar Equalization Board, Inc., 111 Wall Street, New York City. Beekeepers living west of New York and Pennsylvania can only write direct to the beet sugar refineries, a list of which follows:

Mount Clemens, Sugar Co., Mt. Clemens, Mich.
Owosso Sugar Co., Owosso, Mich.
Michigan Sugar Co., Saginaw, Mich.
Minnesota Sugar Co., Chaska, Minn.
J. H. Laws & Co., Cincinnati, O.
D. A. White & Co., 216 Elm St., Cincinnati, O.
Ohio Sugar Co., Ottawa, O.
Toledo Sugar Co., Rossfield, O.
Continental Sugar Co., Toledo, O.
Utah-Idaho Sugar Co., Grant's Pass, Ore.
Amalgamated Beet Sugar Co., Ogden, Utah.
People's Sugar Co., Salt Lake City, Utah.
Utah-Idaho Sugar Co., Salt Lake City, Utah.
Holly Sugar Co., Boston Building, Denver, Colo.
Pope, Charles, 332 S. Michigan Ave., Chicago, Ill.
Garden City Sugar and Land Co., Garden City, Kans.
Columbia Sugar Co., Bay City, Mich.
West Bay City Sugar Co., Bay City, Mich.
Michigan Sugar Co., Crosswell, Mich.
Continental Sugar Co., Detroit, Mich.
Holland-St. Louis Sugar Co., Holland Mich.
Western Sugar Refining Co., Marine City, Mich.
Sugar Refining Co., Menominee, Mich.
Chippewa Sugar Co., 428 Grand St., Milwaukee, Wis.
U. S. Refining Co., 428 Grand St., Milwaukee, Wis.
Wisconsin Sugar Co., 428 Grand Ave., Milwaukee, Wis.
Sheridan Sugar Co., Sheridan, Wyo.
Alameda Sugar Co., 310 Samson St., San Francisco, Cal.
Spreckles Sugar Co., 60 California St., San Francisco, Cal.
Santa Anna Sugar Co., Santa Anna, Cal.

The 1919 crop of beet sugar is just now becoming available. The beekeepers should save their bees at any cost, since honey bids fair to remain high through the coming year. Only granulated sugar should be fed for winter stores, since no other sweet is safe for this purpose.

The sugar situation for beekeepers is critical over much of New England, New York, Pennsylvania, the Carolinas and Georgia. Through Ohio, Indiana, Illinois, parts of Iowa, Minnesota and Michigan, similar conditions prevail.

The beekeeper who has honey on hand from colonies free from American foulbrood should at once feed all needy colonies and not risk being able to get sugar. This season, of all times, it is important that all bees be given special care in preparation for winter. Extra packing will save stores as well as bees.

Those who find their bees short of stores and are unable to buy sugar, should prepare them for winter under the most favorable conditions and prepare to feed later when sugar is available. If there be ten pounds of stores in the hives, the bees south of the Ohio River and Mason's and Dixon's line should be able to survive until March 1, at which time there should be sugar available for feeding.

Cellar-wintered colonies should be left until as near spring as possible, if they cannot be fed before going into winter quarters. Close watch should be kept that no colonies be allowed to starve for want of stores, and when the feeding can no longer be postponed, they should be fed according to the following directions:

From Farmers' Bulletin No. 695, page 12, Department of Agriculture:

"If honey in combs is not available, the bees may be fed extracted honey; but the usual practice is to feed a thick sugar syrup made of 2 or 2½ parts of sugar to 1 part of water, by volume. To this syrup 1 ounce of tartaric acid should be added for each 40 to 60 pounds of sugar while the sugar is being heated to the boiling point to dissolve the sugar crystals. The syrup should be boiled 15 minutes. The acid helps to invert the cane sugar, thus retarding its granulation in the combs."

AMERICAN BEE JOURNAL

VOL. LIX—NO. 12 HAMILTON, ILL., DECEMBER, 1919 MONTHLY, $1.00 A YEAR

NECTAR AND NECTAR SECRETION

By Dr. Wm. Trelease, Botanist, University of Illinois.

THE great Swedish botanist, Linnaeus, nearly two hundred years ago, basing his classification of plants on their flowers, found it necessary to name and account for all of the parts of a flower. In many cases he found structures that were neither sepals, petals, stamens nor pistils; and as these contained or were wet with a sweet fluid, he gave this the fanciful name nectar—the drink of the gods—and called the parts of the flower that produced or contained it, nectaries.

As these nectaries were different from stamens and pistils, which Linnaeus recognized as the sexual organs of flowers, though they are sometimes connected with them, and as they were different from ordinary sepals and petals, though sometimes connected with them, they presented something of a question mark to the men of that day who were curious to know what the parts of a plant really are and what they do. For this reason the study of nectaries became something of a popular diversion for a generation or two; and a general idea that they are organs for secreting sugar became established; not necessarily an idea of secretion, though, for just as animals excrete various organic substances that are by-products, or waste from some of their functions, so it was thought by some students that the sugar of nectar might really be an excreted waste or surplus rather than a substance secreted because it is to bevome useful to the plant.

Toward the end of the Eighteenth Century a German rector, Sprengel, who seems to have found in Nature a good deal of inspiration that he failed to put over, noticed that the petals of the common German wild geranium were fringed with hairs at their bases. That was in the day before men believed in evolution, but when they did believe in a purposeful creation. Sprengel was convinced that an all-wise Creator would not have made a single hair in vain, and he set about discovering what these hairs were for, much as a sensible person seeing the governor on an engine today would try to find out what it is for. Below the break between two petals, he found a nectar gland, producing its sugary fluid; and he saw the hairs would prevent the nectar from being diluted or washed away by rain or dew. This brought him back to the original question—what nectaries and nectar are for. He got his answer to this by watching the plant and seeing that bees visited the flowers, and removed the nectar as what might be called the raw materials of the honey industry.

Honeybee on Hedge Nettle.
(Photographed by Professor C. F. Hottes).

In Sprengel's day, the general impression was not only that things have been created just as we find them, but created for our own ultimate good. So Sprengel found an answer in discovering that the hair fringe of the geranium petals protects the nectar of the flowers and so preserves it for bees to use in manufacturing honey for our breakfast table.

It is not necessary to walk down Michigan Boulevard on a windy day to realize that we belong to an initiative race. The corner grocery and the drug store show it as well as the windows of milliners and dressmakers, shoe shops and news stands, or as the sights that isue from a barber shop in a college town.

When you stop to think about it, Sprengel could hardly have had the curiosity to study out his geranium question to an answer without being spurred to look at other flowers to see if they might not have something interesting of the same sort to offer. He yielded to the impulse to look at other flowers, and he found his geranium to be a very drab specimen compared with some of the irregular and painted flowers that he studied out in the same way. He must have felt no common pride when, in 1793, he published the results of his studies, with simple but effective illustrations, under a title that meant the discovered secret of

nature in the structure and fertilization of flowers.

But Sprengel seems not to have been the sort of man to whom such an answer really was an answer, and he looked further. It does not seem to have taken him long to see that while gathering their own store of honey, and obviously without consciousness that they were doing anything else, the bees became dusted with pollen from geranium stamens and rubbed it off on geranium stigmas while going their rounds of the flowers. This conclusion evidently answered two questions—what the hairs are for, and what nectar is for.

Fashions run in fads and interests quite as much as in dress. Linnaeus was a great botanist; perhaps none has been greater. He not only reduced a chaotic science to order, but interested men in its study to a remarkable extent. It is rather unfairly charged against him that because his service was somewhat one-sided, those whose interest he awakened were extremely one-sided, in that they did not see or care for much in botany beyond finding, describing and classifying new plants. This was well enough worth doing; it is not finished yet, and will not be finished for many years to come; but it had become so fascinating and workable through the genius of the Swedish master that his followers seized it with eagerness, and it was a long time before a mind of original habits and impulses broke loose from the train.

The man who possessed this originality was Darwin, the author of the now universally accepted idea of organic evolution. To him has been ascribed the introduction of a new teleology into natural science recognizing that structures and functions **are,** because they are, or have been, of use—not of use to man necessarily, though man may turn them to account, but to their possessor.

This was Sprengel's conclusion as to the nectar of geranium flowers, which he found led to their fertilization. The essential difference between his way of seeing it and Darwin's is that he thought the entire mechanism had been specially made by the Creator as a means to an end, while Darwin saw in it the gradual modification of earlier structures because the new were helpful in the struggle of life and their possessors for this reason were likely to survive and pass them on to their offspring.

There is a German country saying that the honey-bee was forbidden the clover because she didn't keep Sunday. Beekeepers know that her tongue is a little too short for the honey tube of the red clover flower and that she doesn't waste time in trying to get what is out of her reach. They know, too, that some races of honey-bees really can suck the red clover nectar because they have longer tongues, and if beekeepers ever want to do it they can probably set an expert plant breeder to work at breeding a race of red clover with a tube short enough so that even the German honey-bee can get at its nectar. Natural evolution hasn't done this. Where red clover is at home bumblebees are found, and bumblebees have no difficulty in reaching its nectar much as hawk-moths get that of a moon flower which is far beyond the reach of any kind of bee. But in the South Seas, where there are no long-tongued bees, red clover finds itself as unable to set seed as the German honey-bee is to get at its nectar. Bee and flower have evolved together where both are at home, into a harmony of structure that is helpful to them both.

Nothing was more suggestive to Darwin in his search for evidences of evolution— or modification through descent, than this sort of harmony of structure and habit in flowers and insects; and one of his earliest and most effective books in bringing his views to the comprehending notice of others was the dealing with the mutual relations between those freaks in flowers, the orchids, and their insect visitors.

Sprengel's title page.

For Sprengel's teleology, Sprengel's explanation of nectar as a means of securing fertilization was sufficient, For Darwin's teleology, it carried another question: why? The geranium flower has both stamens and pistil, standing in its middle. The one might fertilize the other just as well as not, apparently, and yet this does not happen, for the pollen-bearing anthers of the stamens drop off before the stigmas of the pistils come to maturity. The same thing may be seen on any single-flowered "geranium" in a bay window or a greenhouse, or a summer window box or flower bed (only this "geranium" does not belong to the genus **Geranium** of the botanists, but to the related African genus **Pelargonium.**

Looking for a further reason, Darwin saw a step further into the mystery when he found that these and many other flowers that ought to get on without any help are as dependent upon insects through their own failure to bring pollen and stigma together as those are in which stamens and pistils are borne in separate flowers—often on separate plants. To him, nectar and its attendants—flower fragrance, color, variegation, guards of hairs or some other structure—meant what they had meant to Sprengel, fertilization through insect aid: but they meant something more, fertilization of one flower by pollen from another flower-crossing.

And still the questions multiply. Why do not all flowers have stamens and pistil side by side. Why when they have this structure, do they not time the maturity of these essential parts so as to secure effective functioning without all the nectar machinery? In other words **Why** is crossing so commonly necessitated and provided for?

Science of every kind has been advanced by three methods; reasoning,

observation, experimentation. Sprengel's answer was reached by the first two; the new answer sought by Darwin was to be obtained through the third. For eleven years he put the question direct to the plants themselves; fertilizing them by their own pollen; cross-fertilizing them; raising and re-questioning their offspring. More and stronger progeny from crossing was the answer.

The popularity that Linnaeus had given to characterizing and classifying living things, was transferred by Darwin to studying their structure and doings. Sprengel's idea fell upon barren soil, Darwin's was cultivated with care and skill.

Two men, Mueller, a German, and Delpino, an Italian, stand out most prominently among a multitude who observed and wrote and pictured the marvels of flowers and insect harmonies for a generation. All did excellent work in furnishing new details and corroborations, but Darwin had answered the question as to the what and the why of the nectar of flowers.

But there is nectar that is not produced in flowers. Look at the queer spots in the angles betwen the veins on the under side of a Catalpa leaf, when it is young, or at the little goblets on the stalk of a cherry or peach or snowball leaf, or at the pin-head spots on a trumpet-creeper or paeony calyx, and you may see glands there that secrete a sweet fluid. Bees may not care for it, but wasps or ants do. The cotton plant has such nectar glands on the outside of the cluster of bracts about each blossom, and on the back of its leaves.

In a very few cases such "extrafloral" nectar serves the same purpose as that within the flowers; but generally it does not lead to fertilization. Delpino called the nectar that leads to fertilization "nuptial" nectar, and the other "extranuptial."

In the seventies of the last century an English mining engineer, Belt, well known in the ore regions of Colorado, was marooned by his profession on a mining property in Nicaragua. Using his eyes took the place with him of tennis, or of dissipation, which is the white man's bane in the tropics. He saw that a certain sort of ants cut the leaves of trees into bits, which they take into their nests, and that roses and other introduced plants fared hard with these leaf cutters unless they were protected by aromatic oils, as various kinds of citrus leaves are, or in some other way.

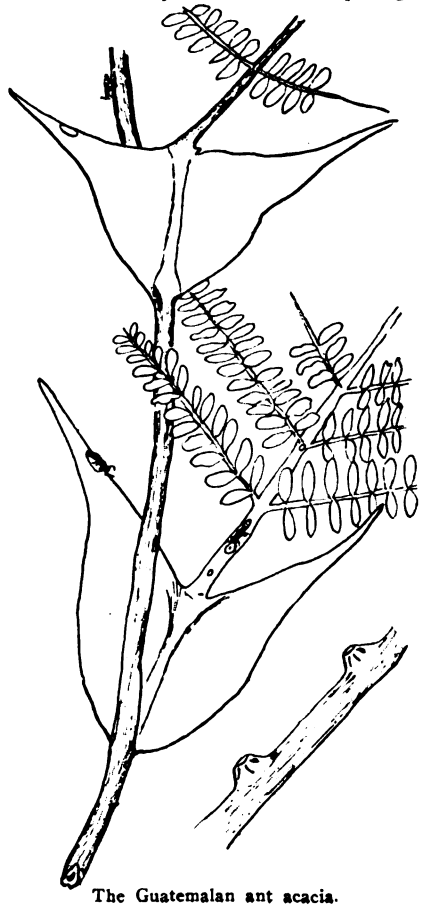
Belt did not fail to notice that the ants visit extrafloral nectaries in numbers. In the case of those on some acacias he found the ants very pugnacious. I confess that in Guatemala I have preferred, myself, to go around a bush or a grove of such acacias with their ant guards. As with Sprengel's geranium hairs, these nectaries unfolded question after question.

In Belt's case, the tips of the acacia leaflets ripen up also into little fruit-like bodies that the ants gather and take into their nests; and they make these nests in the stipules that flank each leaf and sometimes are shaped like a pair of small buffalo horns. It is an interesting undertaking to get the ant census of an acacia twig of this sort. The danger may not be as great, but it is as real and perhaps as painful as in taking the census of a mountain valley noted for moonshine traffic.

Belt drew the conclusion that extranuptial nectar, sometimes supplemented by solid food and shelter, is of use to the plant that provides it by maintaining a bodyguard of ants on plants that otherwise would risk defoliation and injury by leaf-cutters or grazing animals; much as Sprengel and Darwin found an explanation of nuptial nectar in the benefit of insect pollination of the flowers.

This is the simple story of nectar, simply told, as it has been seen by many observing and thinking men. But it is not a story free from complications. Our blue violets rarely set fruit from their showy nectar-bearing flowers; but their main reliance for seed is on flowers produced below the leaves, and these do not open, but are self-fertilized. The beautiful **Poinsettia,** with its brilliant red bracts and large cups overflowing with thick nectar, does not fruit in West Indian gardens any more than it does in our greenhouses at Christmas time. And irresistibly pugnacious as the acacia ants are, those that visit our paeonies and cassias and other plants do not usually more than protest mildly if we molest the plants that they are on.

Are the explanations of Sprengel and Darwin, and of Belt wrong? No others that are at all satisfactory have been offered.



The Guatemalan ant acacia.

When one stops to think of it, the secretion of nectar is an unusual phenomenon. Sugar is made within plants and it does not leak from them unless they have been injured. The sugar beet takes various substances out of the soil water, but it does not permit the passage of sugar into the soil water. And yet nectar, essentially sugar, is passed out of the plant, within which it was manufactured. This is because it is secreted, or excreted, through specialized glands. Everyone who grows plants in a bay window has seen young clover or grass leaves with a drop of water on their tips at some time or other. A few grains of bird seed in a flower-pot covered by a pane of glass will show this as quickly as the seedlings come up.

These drops pass out finally through pores; but they are drops of water and not nectar. If we can imagine a gland behind such a water pore, secreting sugar—letting it really get out of the cells with or into the water—we can picture a nectar gland. Such glands occur in some flowers. Some botanists believe that extranuptial nectar glands were originally water glands that have acquired the habit of secreting sugar.

This habit is a very unusual and a very peculiar one. It is not readily understood except as it may be connected with usefulness to the plant. If this usefulness is not indirect, in the ways suggested by Darwin and Belt, or otherwise, it must be direct. Water glands relieve over-pressure when absorption is high and evaporation low; in some of the calla family the water even spurts from the tips of the leaves at times. But sugar is not like water, taken in in quantity and to spare; it is manufactured, and in the case of nectar glands it is manufactured where it is secreted. Nobody has yet suggested any physiological function of plants calling for sugar safety-valves situated in the queer positions occupied by extranuptial nectar glands; and no satisfactory direct physiological explanation of the nuptial glands has been suggested.

The actual status of nectar in botanical science is about this: when it is produced in flowers, and in some cases when it is outside of them but near them, it demonstrably serves to secure cross-pollination through the aid of insects, or humming birds and their like, when the flowers are long, tubular and red, as in the trumpet creeper, the trumpet honeysuckle and the scarlet salvia. It is then "nuptial nectar." When it does not serve the plant in this way, and so is "extranuptial," it occurs in the neighborhood of the flowers, as in cotton, sweet potato, trumpet creeper and paeony, where it attracts numbers of ants, which are often very pugnacious ,and to the extent of their activities it prevents injury to the essential flower buds and flowers, especially in their early stages; or it occurs on developing leaves during

the period of their greatest need. More rarely, as in the acacias, the leaves continue to secrete it through the season, so that those that are mature add to the protection of the younger leaves and the flowers and the young fruit.

That neither of these functions is served in exceptional cases and that some flowers rely on the wind for effective pollination, or have lapsed into self-fertilization; or that really pugnacious ants do not commonly frequent the extranuptial glands of most plants in temperate regions, and that some plants get along very well without such help, mark questions that will continue to stimulate observation and experiment. But nothing now known of the physiology of plants offers an alternative explanation for that which connects nectar with either pollination or defense; and until such an explanation can be found, nectar will continue to be regarded as connected indirectly with these services through insect or bird relations.

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language. Consolidated with The National Bee Journal in 1874.

Published monthly at Hamilton, Illinois.

Entered as second-class matter at the postoffice at Hamilton, Illinois.

SUBSCRIPTION RATES—In the United States and Mexico, $1 per year; three years, $2.50; five years, $4. Canadian postage 15 cents, and other foreign countries 25 cents extra, per year.

All subscriptions are stopped at expiration. Date of expiration is printed on wrapper label.

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THE EDITOR'S VIEWPOINT

Brood in the Super

Foloppe Bros., in the "Revue Francaise d'Apiculture" report that wherever the bee-escape has failed to remove the bees, it was because of brood in the super. It appears that worker-bees will not desert brood. This is logical and may explain the rare reports of failure of a bee-escape in removing the bees from the supers. The queen's presence in the supers would have a similar effect.

Aeroplanes for Beekeepers

In the October Gleanings, the old veteran, A. I. Root, tells of taking a short trip at Medina, in an aeroplane. Fourteen years ago there were only 3 automobiles in and around Hamilton, Ill. On the day of the armistice, 13 years later, 443 farmers' automobiles were counted in Hamilton. Who knows but in 12 or 14 years we will all (those of us still living) be riding around in aeroplanes?

Overworking the Queens?

We don't wish to criticize the statements of other publishers on matters of theory. But there are instances when it seems necessary.

The Western Honey Bee, in its September number, page 291, quotes rather approvingly a statement by Mr. Thos. F. Cobb, in the British Bee Journal, that the "overworking" (overlaying) of the queen is the cause of lack of stamina, and therefore of the diseases that afflict the honeybee.

As we see it, the queen lays more or less, according to her capacity to develop the eggs in her ovaries as fast as the food supplied to her by the bees will allow. When her ovaries are empty she is done. Similarly when the male sperm is exhausted in her spermatheca, she lays only drone eggs. But we fail to see in what way the speed of her laying would affect her progeny. Are the chicks hatching from a prolific hen, properly fed, any weaker than those from an inactive hen, slightly fed?

All beekeepers who have watched a prolific queen at the time of her greatest egg-laying know that if she is interrupted in her work, her eggs will drop "like ripe fruit." The question for us to settle is whether we should encourage this prolificness by giving her ample room easy to reach, or reduce her laying to the capacity of a small brood-chamber.

The English beekeepers use either the small skep of straw, or the diminutive British standard movable-frame hive. This hive is reported, in the British Bee Journal of August 28, as containing only 2,400 square inches of comb surface, as against 4,800 of the Dadant-Blatt hive, which they acknowledge is the standard in many parts of Europe.

It seems strikingly evident that, if the greater or less laying of the queen has anything at all to do with the diseases of the adult bee, such as Isle-of-Wight or paralysis, the present condition of English beekeeping would indicate that the small hives, in which the queens cannot fully develop their fertility, are the ones that cause the trouble.

We kept bees for some 40 years in the large hives, larger than the average Langstroth, before we ever saw foulbrood. We saw but isolated cases of paralysis, and never anything resembling Isle-ofWight disease.

We are inclined to take the view that there would be less Isle-of-Wight disease in England if they used large hives. It seems to us much more plausible to expect strong colonies to withstand the changes of climate, the effects of mould or of moisture, than weaker ones. We see nothing unnatural or forced in the active laying of a prolific queen, when she is plentifully fed by her workers. Whenever her spermatheca or her ovaries are getting empty, it is time she should be superseded. Our American beekeepers are getting in the habit of superseding their queens at the end of the second year, to avoid any delay or inaction on their part. We believe that is right.

Let our British cousins give a fair and full trial to large hives, not singly or isolated, but in ample apiaries, as we have done. They will then be able to compare results knowingly with the small hive man.

The British Frame

The British standard frame contains 236 square inches of comb surface. The Langstroth approximately 320. Referring to this matter, R. B. Manley writes in the British Bee Journal of August 21:

"The British standard (hive) is too small for a good strain of Italian or hybrid bees. It is weak and inconvenient, and to get room has to be tiered up too high.

"It will be found that bees winter better and increase very much more rapidly in spring on large combs. The queen will extend on a large comb

when she will not move to another comb."

Right, Brother Manley, we have talked ourselves hoarse explaining this. But even your 16x10 combs are not large enough, and you would say so if you ever tried larger ones on a sufficient scale. That was our experience and many are getting awakened to that fact.

ARE WE GOOD SAMARITANS?

Third List, Belgian-French Relief

Cash subscribed in former lists	$272.85
Porter C. Ward, Allenville, Ky.	5.00
H. Christensen, Toppenish, Wash	10.50
S. Barbeau, St. Eustache, Quebec	5.00
C. E. Fowler, Hammonton, N. J.	5.00
F. E. Millen, Guelph, Ontaria	5.00
I. N. Arnold, Kanola, Iowa	5.00
J. F. Diemer, Liberty, Mo.	2.00
R. E. Newcomb, Cleveland, O.	5.00
A. S. Ferry, Naugatuck, Conn.	5.00
L. Van Butsele, Collinsville, Ill.	1.00
F. W. Lesser, East Syracuse	10.00
Total cash subscription to November 9	$331.35
Queens promised:	
Former lists	83
Ben G. Davis, Spring Hill, Tenn.	50
Hardin S. Foster, Columbia, Tenn.	25
Total number of queens promised	158

Of the above number of queens, 123 are from Tennessee. Are beekeepers of Tennessee more generous than those of other States?

Additional supplies promised value $324.

Adding up these different items, we have already about $800 in value promised, and all the cash is paid in. We should readily get $5,000. This would make a donation worth while, especially when we transfer it into the sadly depreciated currency of Belgium and France. Late news indicates that France has less than half the number of bees owned a few years ago, in the undamaged regions, while the devastated areas are entirely bare.

This is the holiday month. Come on, friends, and make a little Christmas present to your brothers across the water. We will prove once more that "A friend in need is a friend indeed."

All donations will be published and the destination of the gifts will be made known as soon as arranged.

Bear in mind that, when you subscribe to charitable organizations, you are entitled to deduct the amount from your income tax report, thus lessening your tax.

Direction Bees Fly

In the British Bee Journal, contributors discuss the direction in which bees fly. One man says they go against the wind, "presumably to have the wind in their favor when coming home." Is it not rather because the wind brings them the odor of the flowers?

The Dadant Apiaries in 1919

A number of readers ask for a report of our bee season of 1919. Here it is:

We began the season with something over 550 colonies in 9 apiaries. There was no white clover at all. So we could not expect much of a crop. To cap the climax, the spring season was very dry. Having bees in plenty and nothing for them to do, we concluded to make some increase artificially, and raised the number of colonies to about 730. We were hoping for a fall crop of persicarias (heartsease) and Spanish needles, of which there is always a fair amount in average seasons in this section. But the drought did not permit them to develop so as to give us any hopes of a crop, and we faced the probable necessity of feeding largely for winter, when sugar was scarce and high. Not a very delightful prospect, indeed.

The Mississippi river was high during the spring months. For that reason there was more moisture than usual on the low lands which are protected by levees, for quite a great deal of water seeps through the sands, from the big stream. A visit to the low bottom lands situated from 10 to 30 miles from us convinced us that it would pay to again practice nomadic beekeeping. So some 400 colonies were moved to the bottoms. With some 240 already located near the edge of the bluffs, above the bottoms, we thus had approximately 640 colonies near immense fields of fall flowers. About 300 of them were right in the center of the bottom lands.

The bees were moved on our two large trucks capable of taking 60 of the large Dadant hives at a trip. This is where the small hives would have the advantage. But we are quite sure that their crop would have been less than that of the large hives.

The hauling was done the last of July, the bees transported an average of 30 miles. The caps and supers were carried separately, each brood-chamber being covered with a wire screen nailed on a strong wooden frame fastened on the brood-chamber with staples. The hives were closed at 4 o'clock in the morning, on cool nights, loaded and hauled at once, so as to reach the destination by 7 o'clock.

Had the colonies been as strong as is usually the case in July, the crop would have been immense. As it was, the harvest from Spanish needles, boneset, persicarias and asters was 78 barrels, or something over 40,000 pounds.

The bees are now back in their respective apiaries on the hills for the winter. Although the clover prospect is not very promising, we believe that they will do better on the hills next spring than on those low lands where there is little early bloom outside of willows and a few spring flowers.

Do Bees Need Water in Transportation?

The late Harbison, of California, the first man to ship colonies of bees in large numbers from New York to California by way of Panama, a journey of 5,900 miles, in 1857, wrote as to the need of water by bees in transit:

"Bees do not need water in transit. The different management of bees by different parties who shipped them from New York to California, is proof in point; those who did not water or feed any during the voyage succeeded much better than those who did so regularly; this was the result as tried side by side on board the same ship."

Bees do need water, and very urgently when they have brood to feed, though they can get along some time without it.

Attend the Meetings

Beekeepers today have more chances than at any time in the past to extend their knowledge of bees by attending meetings. Besides the regular State meetings, many counties meet, department experts conduct courses and State experts give demonstrations.

No beekeeper is so well informed but that he can glean some good from contact with other beekeepers. A single idea in practical application may save, many times over, the cost of such trips.

A Bumblebees' Nest

By H. B. Parks

IN the study of any problem one must go far afield to gather the facts that make its solution possible. In the study of the honeybee, thousands have made observations on their behavior, and hundreds have made conjectures as to the manner in which the present high specialization of the species occurred, but only the few have studied the nearly related semi-social and solitary bees with a view to find in these the steps by which the honeybee reached its present state. Most closely related to the genus **Aphis** is **Bombus.** The bumblebees resemble the hive bees in the possession of three casts, in storing pollen and honey, in secreting wax, and in possessing the same social government.

The nest from which the following study was made was located on the Experimental Station grounds at College Station, Texas. Local history claims an age of three years for this colony and the contents of the nest seem to support the claim. It was located on a narrow strip of land between a fence and the cultivated field. The last furrow gave a low bank in which the nest was built. When investigated the nest had a covering of matted grass, dome-shaped and about 24 inches in diameter and a height of 8 inches above the surface of the soil. As originally built the dome had been on the unplowed land only, but with the increase of the years the roof had been extended until it covered the furrow and some part of plowed land. The original door was in the furrow, but at last, owing to the extension of the brood-chamber, the door had been changed to one side.

Let it be said here that when one investigates Texas bumblebees' nests one does not use the methods of the ordinary beekeeper, as smoke only provokes the anger of the bumblers, and a cloth veil is no protection. Equipped with a wire veil and covered with all the clothes one could walk in, the attack was made. Several ounces of ether were poured on the nest and a bell jar placed over it. This was done very early in the morning in the hope to get all the bees at home. However, it was forgotten that the bumblebees have the bad habit of sleeping on the under side of a leaf of some favorite honey or pollen plant. Scarcely had the bell jar been placed when in came a bee laden with pollen, and seemingly before one could plan just what to do, fifteen or twenty heavily ladened angry bees were trying to sting even the fence posts. Seven of these warriors made center shots and the investigator retreated with considerable speed. With trusty net and cyanide bottle the second attempt was made. Thirty-five field bees were put into that bottle before the nest could be approached.

On removing the bell jar it was found that the grass dome was so matted that the ether fumes had not penetrated the nest. A hole was made through the roof and another dose of ether turned in, and in a few minutes all was quiet. The roof was composed of the blades of Bermuda grass so woven and matted together that it was torn apart with difficulty. This mass was 8 inches thick in the center and enclosed in it was found a genuine surprise. In a small cavity that looked as if it might have been used for a long time, was coiled up a blue and green lizard, commonly called a whip-tail. Just what relationship exists between the lizard and the bees is unknown, but from the standpoint of protection from birds, animals, from summer sun and winter cold a better place could not exist for the lizard. Mixed with the grass was a large amount of dirt, which had been taken from the cavity below.

This cavity had been excavated in what had at one time been a cinder walk. The hole was circular in cross section, flatly oval in the transverse. The opening covered by the grass dome was about 8 inches across, the greatest inside diameter was 12 inches, at a depth of 6 inches, and a total depth of 9 inches.

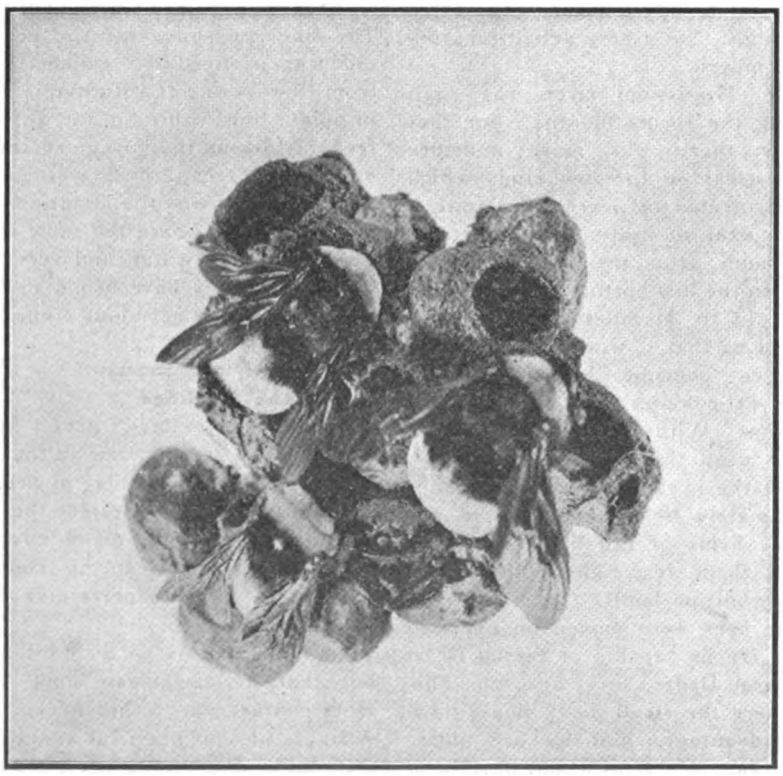
The removal of the grass dome revealed a sheet of capped cells forming a roof to the cavity, and so fitting it that only a bee-space was left around the edge. No adult bees were found on the surface of this comb, but in the depression made by the contact of each group of three cocoons was either an egg mass or larvæ. The larvæ varied from the size of a wheat grain to that of the ordinary "grub worm" of the garden. Under this sheet of comb was a cavity one cell's length deep. The sheets of comb were held apart by a number of single cocoons and strangely from these came only drones. In this opening were many workers, three queens and, seemingly unaffected by the ether, a number of full-grown larvæ squirmed amid the stupefied bees. This second layer contained some empty cocoons and a number of honey and pollen cells. The same conditions were found in the third and fourth layers. The fifth layer was an old one, green with mould and contained nothing to show that it had been used this year. Below this was a mass of older comb, all out of shape, and mixed in it hundreds of bee wings. No explanation can be given for this accumulation of wings.

Not a drone, guest bee or moth was found in the nest. Thousands of little mites were in the nest and on the bees. In two days following the taking of the nest, fifty field bees returned. These were captured by the well-known "jug method." At the end of this time no more bees visited this place.

The comb presented a peculiar appearance in that it was constructed of groups containing about a dozen cells each. Of these cells the following divisions can be made: Queen and worker cells, which are about the same size, and drone cells, which are longer and less in diameter than the others. In addition to these there were cells in which the eggs are laid.

The eggs are pearly white and are laid in a wax cell. This cell is generally placed at the juncture of three cocoons.

The larvæ were present in every stage, but not one was found in a cell nor was there a single partly sealed cell found. Several of the full grown



Newly emerged queens.

larvæ were kept in a pasteboard box several days and two of them constructed cocoons attached to the walls of the box. These pupæ failed to emerge.

When the nest was taken three old queens were found within. Four others were captured among the field bees. No queens were among the bees in the nest. The nest was taken September 10 and no queens emerged from the captured combs until September 20. From that date until September 30, 52 queens emerged. While these cocoons were given no special care, all the queens that appeared were perfect.

No drones were in the nest when taken, and none among the field bees. September 22nd the first drone emerged and on October 1st the last.

The workers were nearly as large as the queens and a very few of the dwarfed or undersized workers were in this colony. The last worker appeared September 18th.

No guest bees or moths could be found, but the yellow form of the drone long described as a guest bee was present in about equal number with those which are colored like the workers. All gradations between the two exist.

The honey found in this nest was water-white and extremely strong, and it appeared as if no evaporation had taken place. Honey was stored in three hundred and twenty-five cells, only a small amount being placed in a cell. In feeding, the newly emerged bee crawls into the cell and does not leave until the honey is exhausted and then it moves on to another cell and some field bee replaces the supply of nectar. No cells were sealed or had more than a few drops of honey in them. These cells were of three varieties, first empty cocoons, second empty cocoons that had wax additions around the top and third complete wax cells.

All of the pollen found was in wax cells, one-hundred and one varying amounts of pollen. Nineteen of these were sealed over. Several of the pollen masses were as large as a hazel nut. The wax used in the construction of these cells is largely mixed with plant hair and pollen grains. The wax was boiled out and was white. Beside making egg cells and storage cells out of the wax most of the cocoons had more or less of it scattered in lumps and an indication of wax base on which the cocoon had been built.

Of the facts stated here a number show the relationship between the solitary and social bees and the steps by which the honeybee reached its present state of developement. In the solitary bees there is only the queen to take part in the rearing of the young. In bombus, one to several queens will live in harmony and a force of workers do the field work. Drones are produced only late in the year. The bumblebee secretes a very small amount of the wax while the solitary bees do not secrete any. It would appear that in the egg-laying and brood-rearing habits of the bumblebee is seen the origin of the double comb. The steps by which this came into existence seem to be as follows: The solitary bee lays a single egg in a honey mass, in a dirt or wood cell, rearing but a single individual to the nest. The semi social improve on this and rear many young in separate but adjoining cells. The bumblebees, utilizing larger excavations, like a mouse nest, start as did the solitary bee, but lay a group of eggs in a single cell composed of wax within the larger opening. As this group of eggs hatches, the cell is extended until it becomes a flat mass on which the larvæ are fed. The full fed larvæ spin their cocoon in a group, the space between the circles being filled with wax, this gives a rude hexagonal one-sided comb. The later egg cells are located in the cavities between the caps of the first comb. As the eggs hatch the larvae crawl into the neighboring cavities and when these larvae spin their cocoons a double comb arranged just like the honeybee comb is formed. While this gives only two one-sided combs mismatched, however, it becomes two-sided as the larvæ seem to choose the thinnest place to cut through in emerging.

In the bumblebees themselves a gradation is shown toward the habits now exhibited by the honeybee. Observers report that in some species only one queen can exist in a nest and in other species only single eggs are laid in each cell and that cells are used many times for brood rearing. To sum up the relationship existing as shown by this nest a condition is found about midway between the solitary bee on one side and the hive bee on the other. The several queens living in harmony point toward the solitary bees, and the existence of a worker cast point to the hive bee. The secretion and use of wax in building cells, the placing of the cocoon to form a rude hexagonal comb, and the fact that in the South there seems to be a tendency for a nest to exist throughout a period of years seem to indicate clearly the steps by which the honeybees reached their present state of specialization.

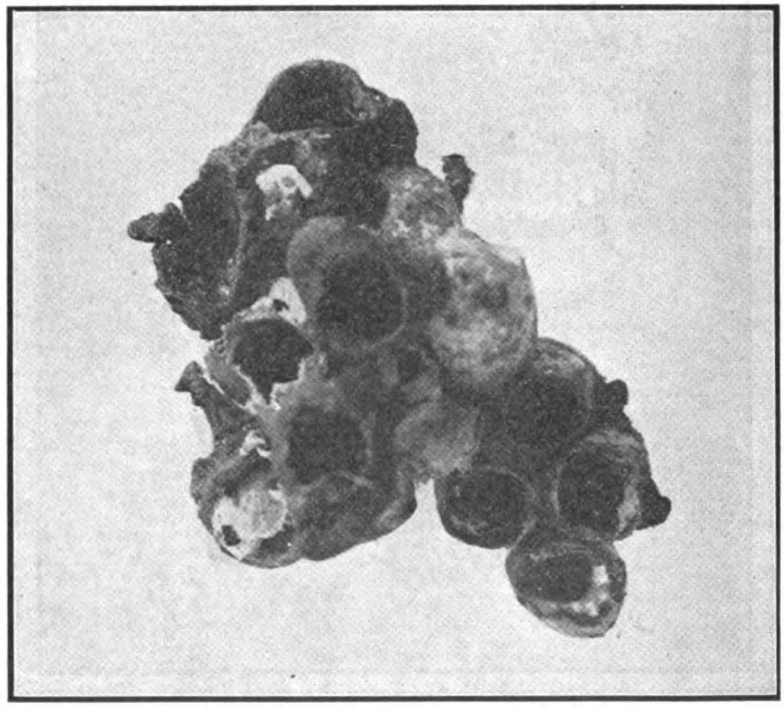
Data relative to the nest of bumblebees taken at College Station, Texas, September 10, 1919:

Number of field force	160
Number of bees in nest	170
Number of queens	7
Number emerged after the nest was taken	209
Number of queens emerged	52
Number of drones emerged	60
Number of old cells (1918)	205
Number of new cells (1919)	742
Number of cells used for honey storage	325
Number of cells used for pollen storage	126
Amount of honey, estimated	1 oz.
Total number of bees	539
Total number of cells	992

College Station, Texas.

Bumblebees and Smoke

In his article "A Bumblebee's Nest" in this issue, Mr. Parks asserts that smoke only provokes the anger of the bumblers. This is contrary to the experience of the associate editor. I have found it possible to control both bumblebees and yellow jackets very nicely with smoke. By blowing the smoke freely into the nest before disturbing the bees, I can open the nest and manipulate the colony much as one would do with a colony of honeybees under similar conditions. While examining such a nest I have had the bumblebees crawl over me quietly and without showing the slightest trace of anger. I would suggest that Mr. Parks try smoke again under more favorable conditions and see whether he is not able to control the bumblebees as readily as honeybees.—F. C. P.



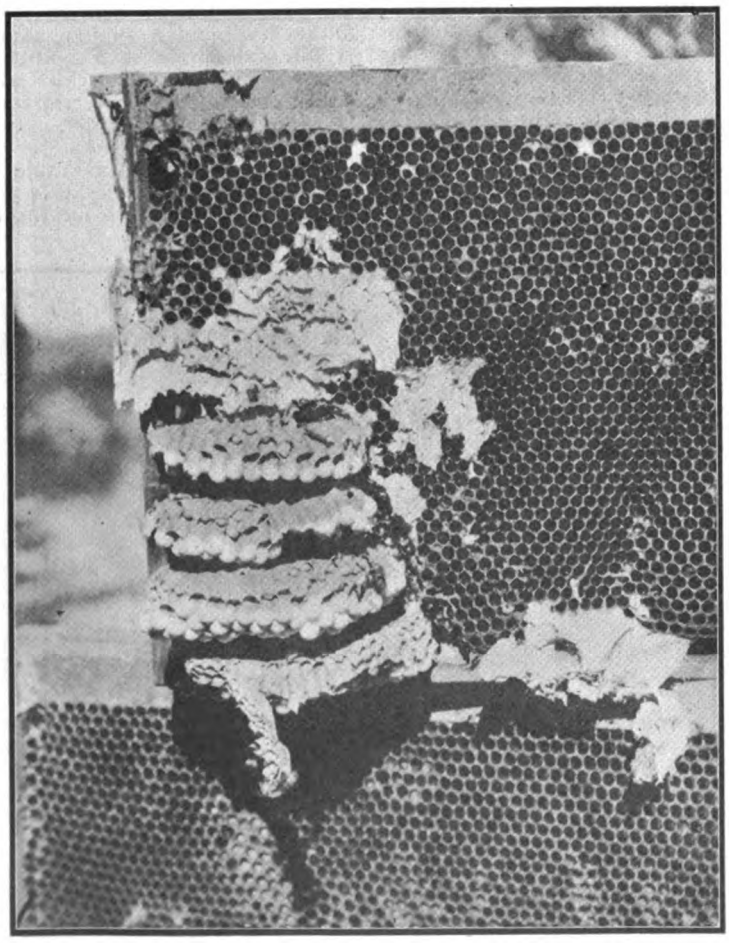
Bumblebees' nest, showing cocoons, honey and pollen cells.

Two Queens in One Brood-Chamber

By Dr. J. H. Merrill,

State Apiarist, Kansas State Agricultural College.

IN the spring of 1919, a queen was clipped in one of the colonies at the Kansas State Agricultural College. In the middle of August, on examining this colony, we found an unclipped queen. According to our records the old queen had been there on the date of the last examination. Thinking that perhaps this might be one of the rare occasions in which a young queen was working along in the hive with an old queen, I suggested that they examine the hive carefully with the idea of perhaps finding another queen, and another was found on the opposite side of the hive on the next to the outside frame. Both of these queens were laying queens, as was shown by the presence of young brood in the comb on which each queen was found. The first thought was that probably this was the old queen, and that she was being allowed to remain for a time with the new queen, but upon examining her it was found that she was not clipped. There were two frames of partially drawn comb in the center of the hive, which were evidently serving as an efficient queen excluder, at least enough so that both queens were working in the same brood-chamber. An examination of this colony again three days later showed that only one of the queens remained, which was only to be expected, as the rather thorough examination of the hive would cause the bees to discover the fact that there were two queens in the same hive. The fact that the clipped queen was no longer present, and as neither of the queens which were found were clipped, shows that both of the queens were young queens. It would have been interesting to know how long they would have gone along in the hive-body if it had not been disturbed, but, of course, as we did not know there were two queens there, we did not try to use any extra caution in examining it.



Part of the wax combs built by the bees had been removed and horizontal combs made of paper built instead.

Sweet Clover a Weed

RECENTLY I had occasion to examine a copy of Prof. L. H. Pammel's book on "Weeds of the Farm and Garden," a large cloth-bound book. I was greatly surprised to find that the author classes sweet clover with the noxious weeds. Here are some of the unfavorable references to sweet clover:

"In lists of weeds commonly found along roadsides, thistle, mustard, ragweed, burdock, sweet clover," etc.

In the Iowa seed law, "seeds of following weeds," include sweet clover (See Sec. 11, 1912).

"Sweet clover, one of the most common weeds of pastures, etc., although occasionally useful in Iowa as a bee-plant, a soil renovator and a forage plant, we must nevertheless regard it as a weed."

"In New England and the Central States such weeds as dandelion, smartweed, burdock, sweet clover, etc., are all common weeds."

In another place he admits that "sweet clover is an excellent bee-plant, a good forage plant, and a satisfactory soil renovator."

It sems this book of Prof. Pammel's was published in 1912, so it may be that since then he has experienced a change of heart in regard to sweet clover, just as many others have been compelled to do during the past decade.

If sweet clover is such a dangerous weed as the accusations I have quoted would indicate, then isn't it strange that so many agricultural experiment stations would urge its wider cultivation? And, again, why should the sale of tons upon tons of sweet clover seed all over the country be permitted, if it is a weed?

In many of the best agricultural papers during the past two or three years the growing of sweet clover has been advised, and plenty of reliable testimony has been given showing its value for hay and for forage. Strange that a "noxious weed" should be found so valuable for so many purposes!

It would seem that it would be entirely in order for Prof. Pammel to correct his statements relating to sweet clover as a weed, unless his book has already been discarded.

For a quarter of a century I have been a booster for sweet clover, and have sold tons of the seed. I have urged its growing not only as a most valuable honey producer, but as a hay and forage crop, as well as a great soil enricher. It seems to me that a plant having so many excellent qualities as does sweet clover, is far from being a "common weed."

How about it, Prof. Pammel?

GEORGE W. YORK.

Spokane, Wash.

The editor has permitted me to see the above letter from Mr. George W. York. Let us remember the definition of a weed: A plant growing where it is detrimental to another crop. If that is true, sweet clover is a weed under some conditions, I say this advisedly. Sweet clover is, however, under other conditions, a most valuable plant, not only as a soil renovator, a forage plant, but a splendid honey-plant. The most reliable honey-plant we have in Iowa.

I would much prefer sweet clover on the barren hillsides and roadsides to a host of other plants. I advocate its planting. However, I have received frequent letters asking how to exterminate it. I have no objection to the planting of sweet clover in its right place. It should be planted. I want to say the same thing about the yellow sweet clover, which at Ames this year, furnished a continuous flow of honey for three weeks. It was better with us this year than white clover.

Sweet clover is mentioned in the Iowa seed law because it sometimes occurs as an adulteration. I have asked that this be eliminated from the law.

The dandelion is classed as a weed. So it is everywhere in Iowa. I don't know what bees would do without it in May and June, and yet thousands of Iowa citizens would like to see it banished. It depends altogether on the special interest of the individual. In our work on honey-plants these weeds will be included as valuable honey-plants.

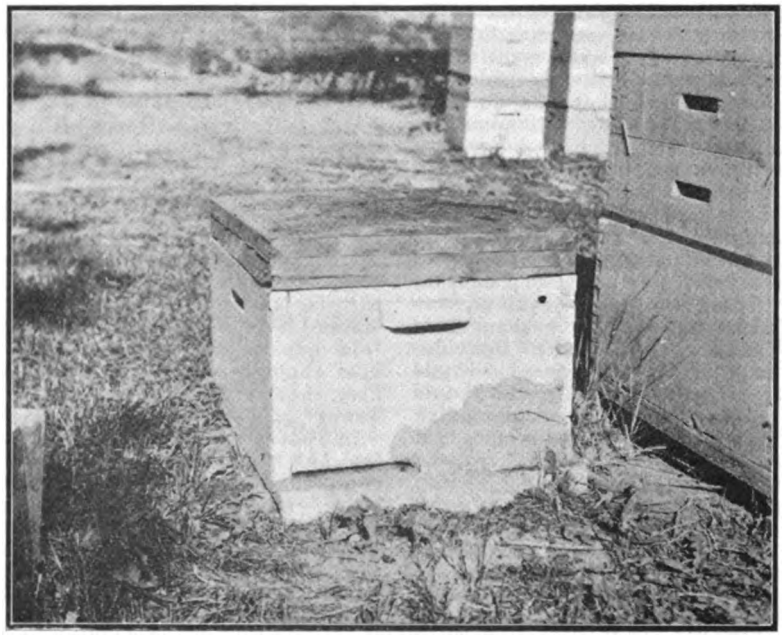
L. H. PAMMEL.

Yellow Jackets in a Beehive

By Frank C. Pellett

WHILE the writer was visiting at the apiary of D. W. Spangler, at Longmont, Colo., his attention was attracted to a hive where the flight at the entrance seemed unusual. There was a strong flight of insects coming and going, but upon examination it proved that the occupants of the hive were not bees, but yellow jackets. On the outside they had built a paper cover, similar to that with which they protect their hanging combs when built in the open. This extended about half way across the front of the hive, as will be seen in the photo.

There was some difficulty in making an examination of the interior. There was some question as to whether the yellow jackets could be subdued by smoke, and the nature of the paper nest made it difficult to remove the frames. With the lighted smoker, the writer approached the hive and undertook to subdue the insects as though they were bees. A liberal amount of smoke was blown into the entrance, then the cover was removed and more smoke blown across the frames. The results were entirely satisfactory, for the wasps made no attempt to sting, except in one instance after the nest had been torn apart. A. J. McCarty and Mr. Spangler, both experienced beekeepers, stood by and witnessed the entire operation. It is hardly necessary to state that there had been serious doubt in the minds of the entire party as to whether these insects could be controlled by smoke. The usual explanation of the success of smoke in subduing bees, is due to the fact that they are induced to fill their honey sacs. Bees are generally quiet when their honey sacs are full. With wasps there was no honey to be had and a different explanation must be sought for.



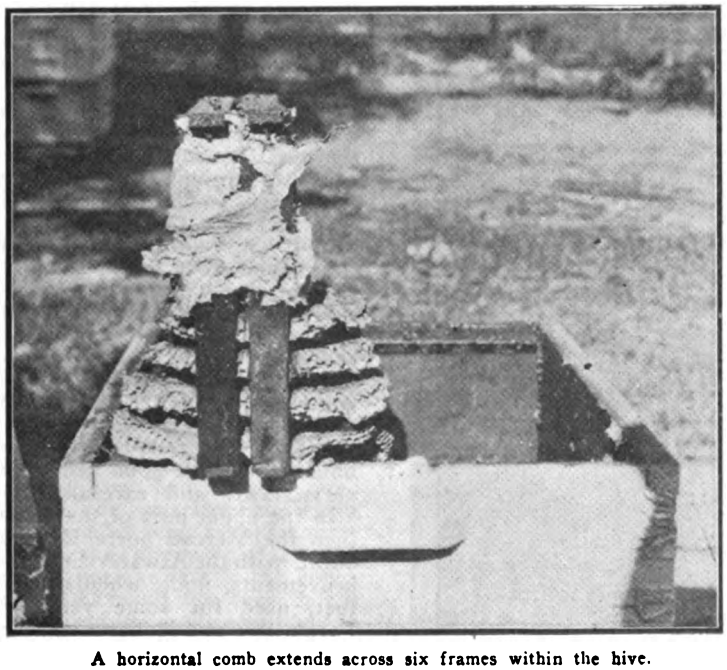
Beehive occupied by yellow jackets.

On removing the frames it was found that a portion of the wax combs built by the bees had been removed and paper combs built instead. The honeybee's comb is made of wax and built vertically, while the combs built by the wasps are made of paper and built horizontally. The differences are well shown by the illustrations.

Notwithstanding the fact that the wasps had built their combs inside the hive, where there was ample protection, they had surrounded them with the usual paper shell. This outer shell was largely broken up in removing the nest.

The cells of the wasps all open downward and the young are attached to the inside by means of a sort of appendage which keeps them from falling out. The nest was a populous one and hundreds of wasps were flying about while the nest was being examined and the photos secured. The combs extended across six of the frames and were four in number.

While wasps may occasionally be seen seeking nectar from flowers, their food, for the most part, is composed of animal tissue. Some species feed to a large extent upon house flies, others upon caterpillars.



A horizontal comb extends across six frames within the hive.

Granulated Honey

By A. F. Bonney

A NUMBER of years ago I was stopping in the town of El Rio, Calif., and visited with a man near there who used to allow beekeepers to set their colonies of bees around his farm (ranch), where he raised vast quantities of lima beans. He got from the beekeepers one pound of honey per colony as pay for the privilege, and at the time I saw him had stored away some fifty cans of honey, which had accumulated, he not thinking of marketing it. This honey was granulated solid. He would cut out three sides of the top of a can loose, use from it until it was empty, then begin on another, and as he worked a force of five to twenty men during the year, there was a great amount of the sweet consumed. No one objected that it was granulated.

Personally, I prefer the solid honey, both to eat and handle, and I believe the time will come when people generally will buy solidified honey as freely as they now do other forms, and that time will come accordingly as the granulated honey is advertised, and people educated; first, that the honey is pure; next, that it may be easily and quickly liquified; third, that it will keep indefinitely unchanged. Beekeepers know that it will be much easier to ship. There will be no leaking.

I think that if the beekeepers of the United States were to individually push granulated honey it would not be many years before we should have a fair trade in this commodity. I judge from my own experience, for I now have a few customers who come to me yearly.

Buck Grove, Iowa.

Hives—8, 10, 13 Frames

By Jes. Dalton

IN regard to the article by Mr. C. F. Davie, on page 344 of the October number, concerning 13-frame hives, I wish to say that I have used these "barns" for years, both in the North and the South. I have 140 of them in use in a 300-colony yard, side by side with both 8 and 10-frames. I wish to comment a little.

First, he says "they accommodate 13 frames snugly with one-quarter inch to spare," and he expects Dadant results with "a minimum of swarming." I never put over 11 frames in those hives, use full depth supers and space same above as below. I let the queen have the run of the hive. I follow the "let alone" plan and take out the solid combs of honey. I do not try to take the honey off by the super full.

He speaks of the queen leaving 4 outside frames of foundation untouched. I would have been surprised had she done anything else. I find 4 or 5 frames of foundation together to be the best thing to make a queen leave the broodnest for the super, and vice versa, wherever those 4 or 5 frames are, if all in a bunch.

But I think Mr. Davie struck the meat in the cocoanut when he reported his wife's statement that it was "the largest swarm she has seen." Those barns will get them for us.

I think we all have a lot to learn about swarming yet, and also about the size and shape of hives. For instance, it is commonly accepted that "old queens cause swarming." But how about a young queen in a little hive, hot and full of brood and honey?

In June my 8-frames got to swarming and over 20 swarmed before I could check it. Some swarmed three times. But out of the 140 "barns," in the same yard, I got 2 swarms. Same yard, same weather and all, except that I had gone through the eights every 8 or 10 days, cutting out queencells and giving ventilation, etc., while I did not have time to go through the "barns" for nearly two months.

I have come to the conclusion that hives are like a lot of other things. You cannot get perfection, and often have to choose the lesser of two evils.

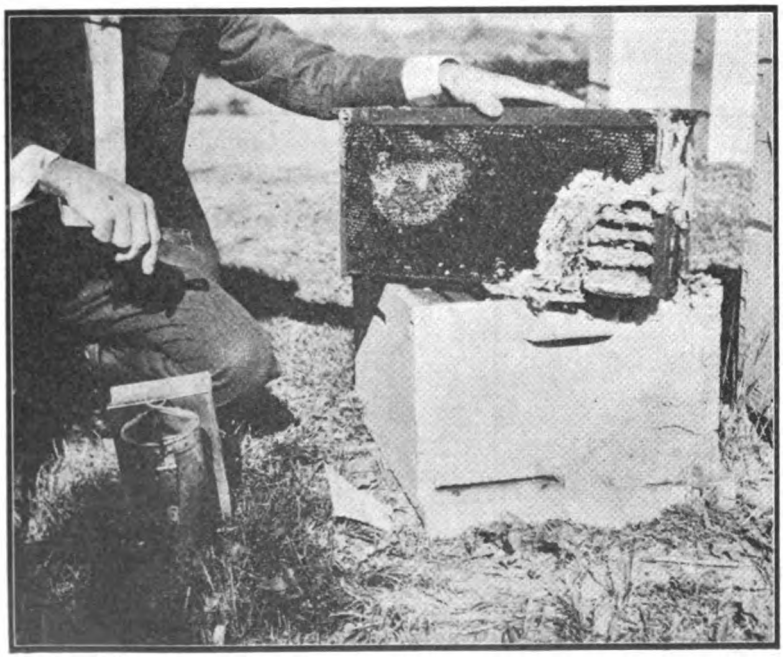
Those big hives are expensive to make and heavy to handle when full of bees and honey. But when run on the "let alone" plan and as non-swarmers, I find them the best I have tried yet.

Eight-frame hives are nice to make, cheap, and easy to handle. But there is something about a tall, narrow hive full of bees that makes them swarm worse than a wide, roomy hive. I prefer 20 frames in 2 stories to 21 frames in 3 stories.

I requeen one-half to two-thirds of my colonies every year, carrying over only my best queens. In looking for preparations for swarming, I notice the behavior of the bees at the entrance, the loafing, the excess of drones, etc.

As soon as a colony needs it, I block up the super with a little stick, for ventilation. If the hive sets much in the sun and is strong, I even block up the cover, for I consider swarming about the worst thing that happens in the apiary.

Bordelonville, La.



A paper shell was built around the combs inside the hive.

The Use of the Truck

By E. F. Atwater

IN these days of rapid transportation, the beekeeper who can reach his yards with a car or truck, and does not do so, is becoming rare, and probably is not conducting his business in the most economical and efficient manner.

Among the favorite means of transportation the Ford stands first, because of low cost and economical upkeep. However, it is the writer's conviction that many beekeepers using the small car with small truck body, which, without overloading, cannot carry much of a load, might more economically do more work by investing a little more money and have a hauling capacity of 1,500 to 3,000 pounds per load.

We use a substantial small truck, carrying easily 1,500 pounds, and, when needed, a trailer which carries nearly as much more.

The light truck carries quite a load when needed, and, being equipped with pneumatic tires, makes nearly as good time on the road between yards as a touring car, but in moving bees or hauling in the honey from our ten yards, we do need more capacity.

Our friends at Parma, Idaho, Messrs. H. M. West, H. E. Crowther and Irvin F. Powers (the Parma Bee and Honey Company), use one or two small cars for quick trips to yards, and for the heavy hauling, a Ford with one of the ton or ton and a half truck attachments, and a large body, 7x9 feet, as shown in the cut.

These truck attachments are of several makes, chain, worm or internal gear drive, and cost $360 and upward. The tires on the heavy rear wheels are solid, eliminating one cause of trouble. Such a re-built Ford costs more than the little Ford ton truck, but the chassis and frame are, I believe, longer than that of the regular Ford truck, and, most important, the springs are very long, easy riding, semi-elliptic, while the springs on the regular Ford are short, unyielding, and reported to be anything but satisfactory for hauling anything as fragile as foundation in frames and sections, or honey in sections or in large combs to extract, unless roads are good and one drives very slowly and carefully.

In the upper part of the cut will be seen the Metcalf portable extracting outfit, with the Atwater-Crowther improvements, floor, when down, 12x16 feet, used for some years by the Parma Bee and Honey Co., and about the same as ours. In this connection

the writer is convinced that, desirable as is the large floor space shown in this portable extracting house, more desirable still is the ability to drive right into a yard and get to work in the minimum of time, which cannot be done with a room, any part of which must be unfolded or set up on arrival, and taken down or folded when ready to move to another yard. The best size for a portable, considering all these points, is 8, 9, or possibly 10 feed wide, by 16 feet long.

The writer has seen one portable 10 feet wide, and aside from a little difficulty in getting into gates, and in passing teams on the road, the size is very satisfactory.

However, after years of use of a permanent outfit, our friends have arrived at the same conclusion as the writer, that where yards are not too distant, the better plan is to haul all combs to a central plant, where everything is convenient.

With the central plant, extracting can go on, as it did with us at one time last summer, when the weather would have entirely prevented the use of a portable, as we used escapes to remove the honey in an all but Arctic spell of weather.

Meridian, Idaho.

Water in Shipping Bees

By A. E. Lusher

HAULING bees and shipping bees from one place to another is no small side issue if followed up year after year in a large way. Bees need water if shipped on cars any distance. When shipping bees on cars a long distance I would prefer to use a can about the size of a corn can, with the same kind of moss that they use in a nursery for ferns, put in the can, then fill half full of water. Take out enough frames so the can may be tacked in the corner of the super, then put on the moving screen. The bees will get the water from the moss and will not drown or be wet. If more water is needed, the can could be filled through the screen. It doesn't matter if they do get a little wet on a car, for they don't get the awful jarring and bumping a large truck gives them. Even in California, all roads are not boulevards, by a long ways, and the bees are in an awful uproar all the trip, from bumps and chuck holes.

I have tried many good ways of giving them water, but find that if they are not closed up too long they will be better off without the water. When the combs have fresh orange honey in them and you have bad roads, it will shake out on the bees and stick them all up so they suffocate while moving.

We try to move them just after they are extracted, before they get in any of the new honey, for they are lighter and the new combs don t wire-cut if the weather is warm. You may wonder why we start moving before the honey-flow is over, but by the time the last of the honey is over we have all the bees in another flow. I have tried filling a comb with water, but it shakes out on a rough road just like the new honey does. Methods and locations differ greatly. What works in one place may not work in another.

Pasadena, Calif.

(The editor believes that water is necessary only when the bees have brood, or when they are fed with dry candy. Fresh honey should be sufficient to supply their needs with the brood. We invite comment on this question.—Editor.)

Fertilizing Drone Eggs—An Experiment

By Gilbert Barratt

THE statement by Dieckel in Germany, and Simmins in England, that queens lay nothing but fertilized eggs, and that in the case of eggs laid in drone-cells the fertilizing element is removed by the workers, led the writer, in view of later investigations, to prove, or disprove this theory.

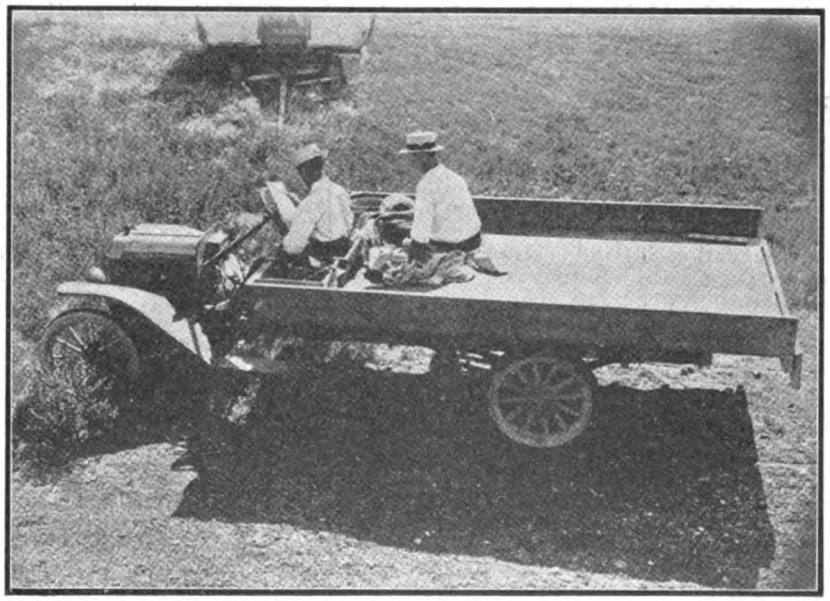
A frame of drone-comb was placed in the middle of a strong colony, and the following day was examined. Fortunately, the queen was found in the act of laying in this comb, and immediately she had withdrawn her abdomen, the cell was closed with a penknife, thus preventing any worker touching the egg. Four cells were closed in this manner, the piece of comb cut out and placed in an incubating chamber running at 97 degrees. The next day a little royal jelly thinned slightly with new honey was placed on each egg with a hair pencil. These eggs duly hatched, were further fed until larvæ were two days old and were then transferred to artificial queen-cups; they were then given to a colony that had been deprived of its other combs being given from above an excluder. They were all accepted and on opening were found to contain dead drones. This experiment was very carefully conducted, and not the slightest opportunity given of allowing any bee to touch the eggs until hatched and larvæ two days old.

The investigation in view, providing the above theory was disproved, was to fertilize drone eggs. Freshly laid drone eggs from a pure golden Italian queen were secured, the comb containing them cut down, and pure Punic drones just arriving in the hive, after a flight, were squeezed over the eggs, in the hope that a spermatazoon would enter the micropile of the egg, and thus fertilize it. The reason Punic drones were chosen was to provide as great a contrast as possible, seeing that the Punic is intensely black and possesses several distinctive features. The queen chosen for the eggs was one producing the lightest and yellowest bees. These eggs were then treated exactly as in the foregoing experiment, and produced extremely dark queens, considerably darker than leather colored Italians. Several queens duly mated, some to yellow, and some to black drones, but nearly all workers showed unmistakable evidence of Punic blood. Drones returning from flight were selected because the air sac being distended, the expulsion of the male sperm was facilitated.

The eggs of a mismated pure golden queen were the subjects of the next experiment, and pure golden drones used; these produced bright golden queens, and finally, the eggs of a drone-laying virgin were tested in the same manner, these also producing queens exactly as in preceding experiments. We therefore have the anomaly of pure queens from a mismated mother, also queens from a virgin.

The value of these investigations, apart from its entomological interest, lies in the fact that all queen breeders, who are building up a high-class strain, can **definitely** introduce any given blood into that strain, and, owing to the comparative simplicity of the process, should interest all queen breeders.

The writer was not successful in fertilizing eggs from Italian fertile workers, nor was the experiment successful when using eggs nearly due to hatch. The age of the eggs may be



Atwater's truck.

easily determined by their position in the cells, a newly-laid egg being stuck point downwards, and gradually leans over until the third day, when it is quite flat. It will be interesting if Dr. Phillips or Mr. Pellett will try this out, and give the results of their investigations.

Sheffield, England.

(Parthenogenesis is no longer a theory, because it has been proven so many times over. But the above experiment is interesting, nevertheless, because it gives us a new idea, something which we believe has never been tried before, or at least never recorded. Fertilizing drone eggs in this manner looks plausible, at least for the sake of experiments. We trust our investigators will give it a fair trial.—Editor.)

Temperature and Nectar Secretion

By Kennith Hawkins

THAT high night temperatures are not conducive to the secretion of nectar by honey plants, is indicated in the data collected at Watertown, Wis., during the summer of 1919, from a careful study of honey plants, by the G. B. Lewis Company's apiary and the records of the U. S. Weather Bureau here. Scientists know that relatively low night temperatures with considerably higher day temperatures are valuable to enable many honey plants to effect the change of starches to sugar within their systems, preparatory to nectar secretion next day. The temperature effect in slowing down nectar secretion in white clover, raspberry, basswood and sweet clover, in the order named, is noticeable.

On the graph accompanying this article, the heavy line (see Note 1) shows the gradual increase in the mean daily temperature from May 1, 1919, to July 31, 1919, beginning at 52 degrees F. and ending at 75 degrees F. The dotted line (see Note 2) represents the storing strength of the colonies, which arrived as 3-pound packages from Texas on May 7th, the date represented on the graph as A. The point B, on the dotted line, shows June 6th, the first day the bees began work in the supers. C. represents the peak of storing of surplus, and D. the greatest decline registered on July 31st. The bees were released on brood-frames with full sheets of medium brood foundation and the colonies had to draw out thin super foundation in the extracting frames. They were not fed, as they arived here in a good dandelion flow. Note that the point L., on the top horizontal line (see Note 4) represents the date when the first white clover bloom appeared, and M. the date of the first raspberry bloom, and N. the date of the first basswood bloom. O represents the first sweet clover bloom. The heavy graphs, N. Y., and Z, (see note 3), represent the relative rainfall for the three months, May, 2.45 in; June, 1.49 in., and July 4.00 in.

Blooms Last—Nectar Stops

The writer wishes to emphasize that sweet and white clover remained in bloom long after the bees stopped storing surplus honey and that sweet clover was still in bloom here August 27, with the bees working on it heavily, but with no signs of the nectar in the supers. Please note that the heaviest rainfall of the months was in July, cutting off the drying-up theory relative to the failure of the honey plants to yield nectar. Robbing began to be noticeable here August 1, and the bees have since placed no surplus honey in the supers.

This indicates that something other than the condition of the bees, the rainfall or the number of honey plants affected the cessation of nectar secretion. The writer believes the cessation is due to the constantly increasing mean temperature, which was particularly noticeable at night.

The following table is of interest:

May 7—Bees here.
May 10—First eggs noted in frames.
May 26—First white clover bloom.
May 28—First red clover bloom.
June 6—First colony begins in super.
June 9—Locust blooms.
June 9—Raspberries bloom.
June 17—Heavy flow from white clover.
June 20—Basswood buds begin opening.
June 21—First sweet clover bloom.
July 3—Bees desert basswood.
July 15—Last supers on filled slowly.
August 1—Bees robbing badly.
August 10—Sweet clover, toad flax, goldenrod, red clover, dandelions bloom.
August 27—Bees still robbing badly on opportunity.

Explanation of Graph

I.—Heavy line shows average mean temperature increase from 52.9 degrees F.

II.—Dotted line shows: Arrival of bees at A. (May 7); begun super work at B. (June 6); peak of storing at C. (July 15), and robbing at D. (August 1).

III.—Heavy graphs represent comparative rainfall for the months of May, June and July; May, 2.45 in.; June, 1.49 in.; July, 4.00 in.

IV.—Dates marked on the top horizontal line marked to indicate the beginning of honey-flows from: L.—white clover; M—raspberry; N—basswood; O—sweet clover.

V.—Daily night temperatures not shown for lack of space. Daily mean temperature increase adopted since complete figures show daily increase in night temperatures, which are relative.

Watertown, Wis.

What Beekeeping Offers for Disabled Soldiers

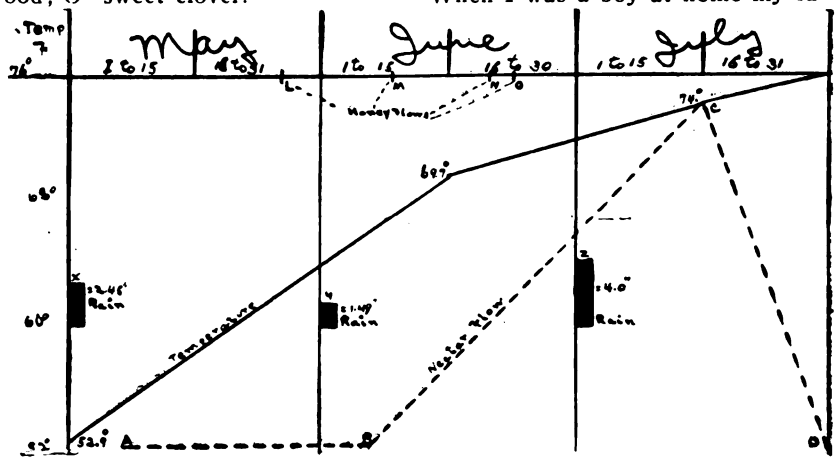
By Frank R. Townsend

Vocational Educational Student, Kansas State Agricultural College

THE question of securing employment for disabled soldiers is one that would ordinarily cause a great deal of concern and no little worry to the men themselves. However, since the creation of the Federal Board of Vocational Education, the solution of this problem has been greatly simplified. I am one of these men, and wish to say a few words as to the benefits I think I am going to receive from this work.

On the 28th day of September, 1918, I was struck by a machine gun bullet, which caused a compound fracture of my right leg. After the wound was healed the leg was shorter than before the injury. I do not believe that a man is crippled unless the injury is in the head, or, in other words, if he has any ambition there are great opportunities open for him to obtain an education, and fit himself for business. Even though a man may be so disabled that he cannot do all of the heavy work about the apiary himself, yet, if he understands the nature of bees well enough, he will find beekeeping will pay enough income so that he can afford to hire someone to do the heavier work for him whenever necessary. This is especially true in the case of a disabled soldier who has an opportunity of taking advantage of the education offered by the Federal Board of Vocational Education. I am taking advantage of it myself, and attending the Kansas State Agricultural College at Manhattan, Kans., where, since the first of May, among other studies, I have been taking beekeeping under Dr. J. H. Merrill, and have become greatly interested in what this beekeeping business holds as a future for disabled soldiers.

When I was a boy at home my fa-



ther kept a few colonies of bees and handled them for comb honey. Although his hives and tools were of the crudest sort, and the price usually obtained for comb honey at that time was only 10 cents per section, he made a small profit from them. My portion of the work was to put the sections together and fasten in the foundation with a Parker Foundation Fastener. Since taking up the study of beekeeping, I find a great deal of difference in what used to be considered necessary for the keeping of bees, and what I now know to be the real necessity, that is, a thorough knowledge of bee behavior. Father's knowledge of bee-behavior was limited. During the winter we made up the sections. In the spring we put them in the hives, and in the fall, if any of them were filled, we removed them. The questions of increase, swarm prevention, requeening, improving our stock, etc., never concerned us in the least.

I do not believe it will take a great deal of capital to make a start in the bee business, providing one begins with a few colonies and gradually makes his increase. By making a small start, I believe that a man can get greater knowledge of bee behavior, and, consequently, know what to expect from his bees at all seasons of the year better than he could if he started in with a large number of colonies, without having experience or knowledge to handle them. Here at the college we get practical experience in beekeeping. They have a good many colonies, and our class work consists of handling and caring for these colonies. Ever since last May we have been engaged in actual handling of the bees, trying out different methods, so as to learn how the bees would act under different conditions, and I think that we have made a very good beginning along the road of better beekeeping.

After spending so much time in France, where I had an opportunity of watching the people get good results from small pieces of ground, I feel that now I could take a much smaller place and make more money from it than I could before I went over there.

I am planning on combining poultry raising with my bees, and I believe that, even though I may be classed as a disabled soldier, the chances for making good in this world have not been withheld from me.

Criticisms

By C. E. Fowler

ON page 267 F. R. Smythe says: "In my opinion the primary cause of swarming is a preponderance of young bees in the brood-chamber." And on page 271 G. C. Greiner says: "It is the old stock which is bent on swarming; young worker bees the same as young queens are less inclined that way." Who is right?

Beekeepers seem to have so many different ideas as to what causes and how to prevent swarming that a new beginner is fairly dazed and works overtime trying to follow them all.

I would like to suggest that they are both wrong and will try to prove it by saying that in my system of swarm prevention, which worked 100 per cent this year, I paid no attention to old bees or young bees to keep them either in or out of the brood-chamber. I might also mention that the large hive advocates do not make any provision for keeping either young or old bees out of the brood-nests. At least one of them must be wrong.

Then I think you are overworking Dr. C. C. Miller, making him answer so many "Tom-fool" questions asked by new beginners who are too poor to buy a bee-book and are just getting the fever and want to know it all at once. Look at "Miscellaneous Questions," page 278. 1st, "How much profit can be made out of one colony of bees?" 2nd, "How many colonies can one man tend?" Iowa has the fever badly and wants to make money **on paper,** as quickly as possible.

On page 277 the Doctor has again made the mistake of saying carbon disulphide will kill eggs of the moth.

(I have been asked where I got the authority for saying that carbon disulfide would kill the eggs of the bee-moth. I don't know. I think that wherever I first read of this drug as a good thing to destroy the larvæ of the bee-moth, it was stated that it had the advantage over the fumes of sulfur that it would kill both eggs and larvæ. I had a lot of combs in which the bee-moth had begun its work. I treated them with carbon disulfide, and found no occasion for a second treatment. If I had used sulfur I should have expected a second crop of larvæ from eggs not destroyed. Still there is a possibility that in that particular case all eggs had hatched before treatment.

A returned soldier takes up beekeeping at the Kansas College.

Turning to the books, I don't get much light. Some of them are silent as to the eggs. One of them speaks of using the fumes of burning sulfur "to kill the eggs or worms of the moth." (I'm pretty sure that's a mistake about the eggs.) Another says that when the larvae are killed by sulpher, "eggs also are, at the same time, destroyed." Another says the eggs are usually not destroyed by fumigation. So there you are.

Who can offer satisfactory proof either way? If one failed to kill eggs with carbon disulfide, is it certain the dose was heavy enough? If one fumigated and had no eggs hatch after, is it certain any eggs were present? Help!—C. C. Miller.)

I would like to tell "Alabama" (last answer, page 378) a good way to transfer 10-frame standard to Jumbo. First, nail a seven-eighths piece of wood on the bottom of the standard frame, making the frames the same depth as the Jumbo, and put them right in the Jumbo hive, and the job is done. Then by the aid of full sheets of foundation and a good honey flow get the queen on the Jumbo frames and the standard above an excluder, and when filled with honey extract and melt the old combs, which would never be satisfactory left in after cutting and transferring the old way.

But why change to the Jumbo? On page 274 Arthur C. Miller says of the long-idea hive: "They are great, unwieldy things," which applies equally to the Jumbo.

The easiest of all ways to handle bees is to use the standard 5 11-16 extracted honey super for brood-nest and all, making everything standard and interchangeable.

The two magic words of beekeeping are "standard" and "interchangeable."

Hammonton, N. J.

(We trust our correspondent will forgive us if we say that we find no contradiction in the statements of Messrs. F. R. Smythe and G. C. Greiner. The "primary cause of swarming is a preponderance of bees," and of course it must be young bees, since a colony increases only by hatching of additional bees. But "it is the old bees which are bent on swarming," owing to that very preponderance which causes the hive to become overstocked. So these two writers agree and are both right.

But there is no need to make provisions to keep either young or old bees out of the brood-chamber, if there is an adequate amount of room.

As to overworking our Dr. Miller, we believe our correspondent is right. Too many questions are asked which one would find answered in the books. But if we were to leave out **all** the questions that may be found answered in the books, the department of Dr. Miller's Answers would be very small. The intention is to give information to beginners,

and incidentally to some experienced apiarists.

Mr. Fowler wants beekeepers to use only shallow bodies for both supers and brood-chambers. He is not the first man to advise this. The Heddon hive was made of shallow bodies, so was the Danzenbaker. Other people want all full depth Langstroth bodies, both for brood-chamber and supers. We have never found it advisable to use the same size in brood-chambers and supers and do not believe that the use of shallow supers with full depth brood-chambers is any more objectionable than the use of sections on full-depth bodies. We can, even then, say that our implements are "standard and interchangeable."—C. P. D.)

Wire Kinks

By F. B. Richardson

IN the May number of the American Bee Journal, Mr. J. E. Crane makes some very interesting and timely remarks about foundation and its sagging. Every extracted honey producer, particularly in a warm country, has at some time had experience with the sagging foundation proposition, in spite of all possible care—as he thinks.

From our experience, the thickness of the wax has less to do with the sagging than the wiring. Before the days of pierced frames we used to be very careful to pierce the frames near the top bar, no matter how many wires we were using, but when the frames came pierced it not only saved a lot of work, but the manufacturer had evidently had experience, as they were pierced quite high up, near the top bar. All the frames we have used have been pierced to take four wires, and this number seems to be the most generally successful, three not being quite enough to avoid large spaces between the wires, and five being a waste of time and wire, with no added advantage.

The method of wiring by simply threading the wires through the holes, then tightening until they "sing," has not proven the best method with us, as the wires are bound to slacken by drawing into the wood, with the result of bulging combs, sometimes in three or four separate bumps, or the top tears out or the middle caves in, making very poor combs for any purpose. We have tried wire at all distances and nearness to both top and bottom bar, but with always the same result, so long as the wires are simply threaded in as above.

Happening into a supply dealer's one day, and having to wait some little time, an investigating tour of the premises discovered some frames in process of wiring by an entirely new method, and one that looked very reasonable. No. 3 fine or lath nails were inserted in the holes in the frames and the nail curved into a hook on the inside of the frame with a pair of round-nosed plyers. The little hooks are made so the wire just slips under easily, and with a little practice they can be turned out at a lively rate. The wire is threaded around these hooks and then drawn tight. There is absolutely no "give" to the wires done this way, the only necessary care being not to draw in the sides of the frame so as to spring it out of shape. We wind the wire on itself to start with and finish it the same way, using an electrician's twist. If wound correctly there is no danger of its ever pulling out.

Another thing we have found of importance in avoiding sagging wax is the size of wire to use. We used to buy No. 30 tinned wire by the stone, but now we buy No. 26, as it does not break nearly so readily, is easier to imbed and holds its position better, being heavy enough to support the wax without sagging. In fact, we have never had a sagged comb since using it, and we have hundreds of them made over this sized wire, held by the hooks and filled with light brood foundation.

As there is a considerable saving of wax by the use of the light instead of the medium or heavy brood, and the combs stand the wear and tear of extracting as well as any we have ever used, we can see no advantage in the extra weight through the center.

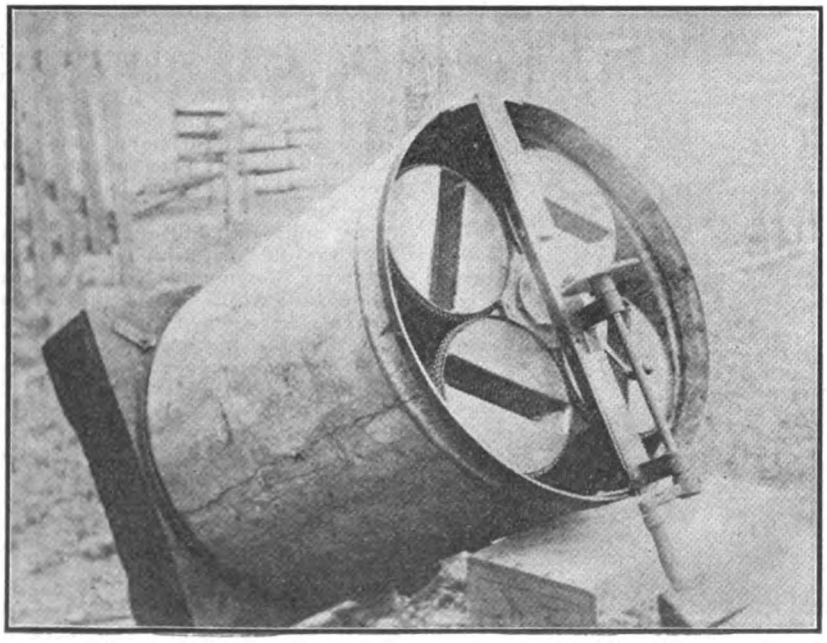
In buying a yard of bees we sometimes come across some very novel, not to say peculiar, things, but the strangest thing to me has been the many systems—or lack of systems—of putting in foundation. We found one idea not long ago which was really funny, or would have been if it hadn't been a little pathetic, where a man had wired his frames from corner to corner for **extracting!** It might be a bit of improvement on no wiring at all, but very little, I'm afraid, for this climate. One of our neighbors does not believe in wiring at all, as he is thoroughly convinced that his comb would melt down in the hive, his theory being that the wires atract heat. There is an old saying that "it takes all kinds to make a world," and sometimes we do not have very hard work to believe it.

Hughson, Calif.

A New Honey Extractor

The extractors now in use have some serious drawbacks. The most serious of these is the damage to tender combs when extracting for the first time and the necessity of stopping the machine to reverse. A machine has been invented by T. W. Livingston, of Georgia, which overcomes both these difficulties. The cause of breakage of new combs is frequently the heavy pressure from throwing out the honey from one side while the honey still remains on the opposite side of the comb. Mr. Livingston's extractor can be reversed several times while the machine is in motion, thus doing away with the necessity of stopping or slowing down the machine. This being the case, it is possible to reverse it frequently while the combs are being extracted, thus throwing out a small part of the honey from one side and reversing to throw out an equal amount from the other side, thus equalizing the pressure and removing the honey gradually.

With the machines now on the market the baskets are hinged on one corner, thus throwing the basket clear around with a bang when it is necessary to reverse. The Livingston machine is pivoted under the center of the bottom of the basket and it is reversed by swinging it around on its pivot. Instead of being necessary to reverse the baskets in an opposite direction from that in which the reel is revolving, this machine reverses by simply making a half turn in the same direction. It is possible thus to reverse as frequently as desired without checking the motion of the ma-



Livingston's extractor.

chine. The baskets always turn in the same direction. We are showing two pictures herewith, which will give a good idea of the construction of the machine. The one shows the top view of the baskets and the gearing. The other shows the complete machine.

The movement of the earth on its axis as it revolves around the sun furnishes a good illustration of the way the baskets inside the extractor turn on their pivots, while revolving around the inside of the can. Mr. Livingston has extracted thousands of pounds of honey successfully with this machine. He first described it in this journal in 1909. The same machine has been in operation in his apiaries since that time, so that it is safe to say that the principle is correct and beemen may hope to be relieved of the annoyance of the breakage incident to reversing with the old style extractor.

Punics or African Bees and Parthenogenesis

THOSE of our readers who have read the editorial on the above subject and the Baldensperger article on the same matter in the November, 1918, number of the American Bee Journal, will remember that the question raised is whether any Punic or South African worker-bees have a capacity to lay eggs that will hatch and produce perfectly developed females, without previous impregnation.

The quotation which we made, from the "Western Province Bee Journal," on this question, convinced us that its editor, Mr. Attridge, is entirely disinterested and impartial in this matter. So we wrote him to ask his opinion. He replied in a long letter, from which, with his approval, we quote as follows:

"From my own experience I can say that it is quite a common thing for our South African queens to take wing during manipulation while the hive is open. Unless great care is taken, it is easy for a queen to enter a super or to settle in a small cluster anywhere and enter a hive.

"I have experimented with several colonies regarding **'worker-laying workers,'** but my results have been negative. In every instance I have failed to produce workers from workers, although the Rhodesian Entomologist considers Mr. Onions, who conducted experiments under his supervision, to have proved his claim that they 'produce females without male impregnation' and that this 'appears to be the rule to which male development is the exception.'

"It is generally believed that only one queen is allowed in a hive at one time. When inspecting colonies in Johannesburg (for European foulbrood), I found, in one hive containing bees, brood and stores, no less than six young and active queens, besides some sealed queen-cells. I was struck with the number of queen-cells in nearly every hive opened in that part of the country.

"Three years ago I raised three queens at the same time in an observation hive. One of them was slightly small, but she mated successfully (indicated by the presence of the genital organs of the male), and became a worker-laying queen. The other two were scarcely larger than an ordinary worker. One of them lived about a month and then disappeared. The other one lived in the hive for 5 months. Although such queens would be difficult to find in a populous colony, I had no difficulty in picking her out from among the workers in the observation hive on account of her shape. When seen enlarged through a hand lens, she looked a perfect queen. She was shy and preferred the dark places on the top and edges of the comb. Sometimes she would wander on the face of the comb and deposit eggs in the cells surrounding the brood patch. All of her eggs which I marked disappeared in 24 hours. They were no doubt removed by the workers. I believe they were drone eggs and as drones were apparently not required, the bees would not rear them. If, by any chance, the worker-laying queen came near the supposed drone-layer, the latter fled as fast as possible. She was also sometimes worried by the workers. This is the only time I have observed workers worrying a queen, even though there were more than one present in the same hive. The distance from the inside of the hive to the outside was 3 to 4 feet.

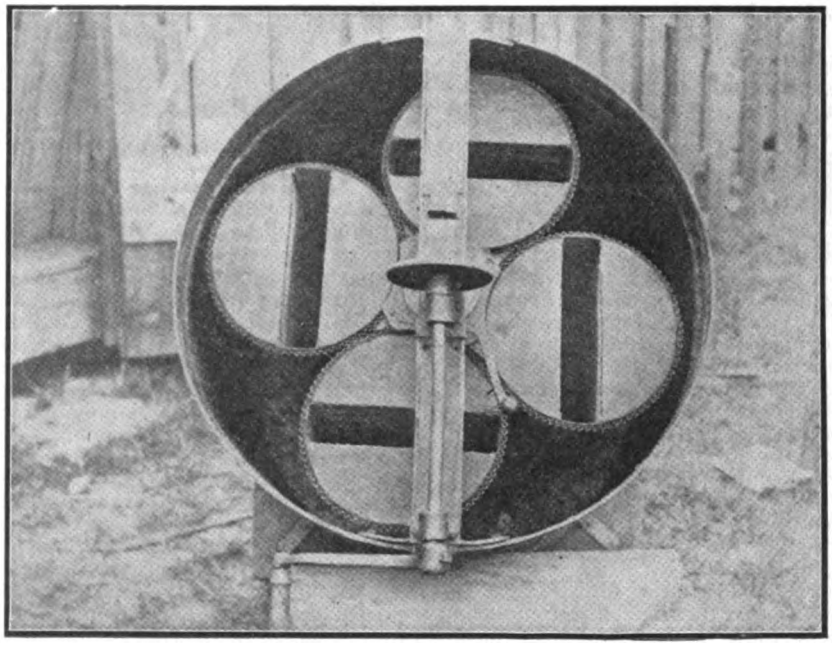
"Do fertile or laying workers work in the field the same as ordinary workers until such time as they assume the maternal instinct, or do they remain in the hive to be fed and treated as normal queens? I should believe the latter.

"There is no difference in the egg which produces a queen or a worker. Special feeding produces a queen. This was proved by Huber, who fed worker larvæ with royal jelly, and when emerged he painted the thorax and amputated the right antenna. He afterward caught some of these workers in the act of ovipositing. He wrote: 'I have repeated the experiment so often, and weighed all the concomitant circumstances with so much care, that whenever I please I can obtain fertile (laying) workers in my hives.' The perfect queen is capable of mating. The laying-worker is considered to be incapable of mating, yet she is credited by Mr. Onions with power which it is generally believed is denied to the perfect queen. If the worker can generate workers, why does nature give them a queen or mother-bee, without which no colony can survive? The fact that the ancient Egyptians of the 12th Dynasty used the figure of the queen-bee to denote sovereignty shows that thousands of years ago the honeybee had evolved to the stage of a queen or mother-bee for the colony. It seems remarkable that this bee retains what may possibly be considered the original type, i. e., each female perfect and able to reproduce her kind.

"As far as I can gather, Mr. Onions makes no mention of unmated African queens possessing the power of producing worker-bees.

"Is a perfect unmated African queen able to produce both workers and drones? If not, why should a laying worker be able to do so? This has an important bearing on the subject. Mr. Onions used what he described as 'African bees.' These he obtained from near Cape Town, where no pure race may be said to exist, where in past years scores of colonies, English, Carniolan, Italian, etc., having been imported and acclimatization attempted. In his own apiary, at the Cape, he had an Italian as well as an African

"Hewitt writes of using Punic bees, a bee found in North Africa. Taylor, writing of the Egyptian, i. e., a North African bee, says: 'They possess two striking peculiarities—the first that they never use propolis, but substi-



Top view of Livingston extractor.

tute wax; the second, and a still more surprising one, that they appear to be accompanied in every colony by a fourth order of individuals, consisting in about a dozen of what may either be lalled fertile workers or drone-producing queens, but differing from either of these classes as we find them with other bees, as they are like queens in form, but smaller, and are marked, as are the drones that they and they only produce, by a yellow spot upon the breast.'

"Mr. Onions' latest experiments were carried out in Rhodesia with bees imported from the suburbs of Cape Town. Some of the bees were sent him from near to where his late Cape apiary was situated. What is our 'Cape bee?' One would have thought that a bee of purer African race would be found in Rhodesia; a Punic or Egyptian bee having worked its way down. Mr. Onions does not claim to be able to demonstrate **worker-laying workers** from the native bee found in Rhodesia, but from the hybrid bee from the Cape.

"I know of only one man here who claims to be able to repeat Mr. Onions' experiments, and he acknowledges that the colony does not prosper, and finally perishes through weakness.

"I think we need to better understand the factors which govern sex in mating. In this we are told that there are certain laws which, like those of the Medes and Persians, are unalterable, and it is a question whether, in face of these laws, it is possible for an egg from a fully developed and mated queen, to produce either a **worker-laying worker** or only a drone-laying queen, simply by the difference in the feeding of the larva after the egg—in which are wrapped unalterable laws determining sex—has hatched.

"What we speak of as the 'Cape bee' is not a pure race, but a hybrid. Bees of various colors and stripes and characteristics are found in the hive at the same time. We have yet much to learn about the 'Cape bee.'

"ALF. J. ATTRIDGE."

Beekeeping in British Columbia

OUR old friend and correspondent, F. Dundas Todd, of Victoria, sends us an account of the Provincial Fair, in which three tons of honey were exhibited early in October. It seems that the ladies are doing considerable work in this line, as will appear from the following quotation in the "Daily Province:"

"A Woman Exhibitor.— That beekeeping is not exclusively a man's work is proved by the exhibit of Mrs. McCallum, of Delta, whose display of 300 pounds of honey products gained the first prize, and combined with winnings in other classes, won the gold medal of the exhibition.

"Mrs. McCallum has kept bees four years only, but in that time has forged to the front in this interesting profession."

Mr. Todd's letter follows:

"Dear Mr. Dadant: I am enclosing a readable account of our beekeepers' exhibit at New Westminster Provincial Fair, which I suspect was written by our President, J. H. Winson, a man who turns many a delightful phrase with a facile pen.

"Five years ago I judged the honey at this exhibition. The whole exhibit could easily have been staged on a common kitchen table. The great war brought a cessation of activities in agricultural exhibitions in British Columbia; now, with happier times, they have resumed. The contrast between 1914 and 1919 gives a rather good measure of the advance our province has made, even with the din of warfare sounding in our ears, and the absence of our boys, who were long in deeds but mighty short in claims.

"Our women folks minded the boys' bees, as they did so many other chores, and they did the work well, as you will see from the article. One of them, Mrs. McCallum, simply swept the decks in almost every class, and I want to assure you she is a real beekeeper, doing every bit of the work herself. Furthermore, I want to say I know dozens more just like her in British Columbia.

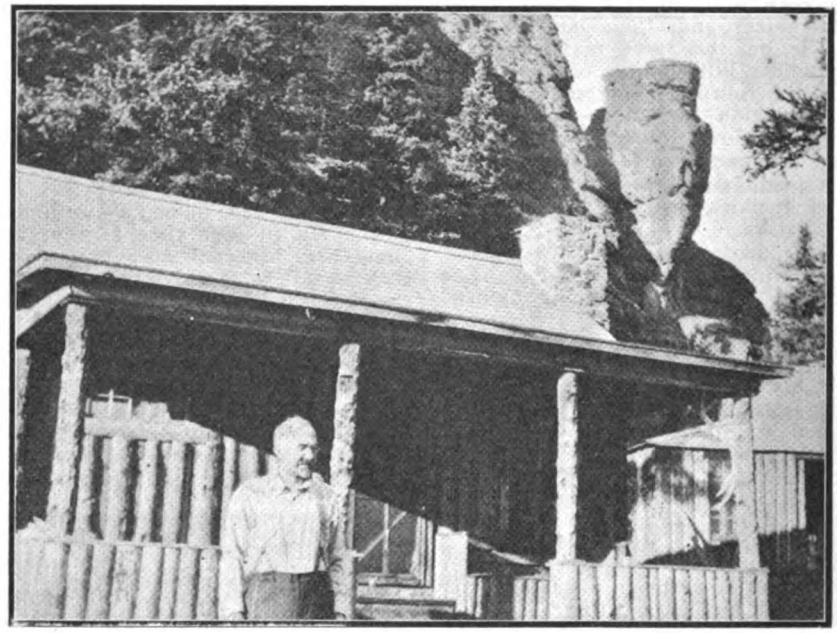
"Our crop, on account of the dry season, is very spotty, but we expect the total to show a decided increase, due to the enthusiasm now prevalent all along the line. These and other matters will probably be dealt with later on.

"I have worked my own apiary over into the Dadant style of hives, with only one modification, I used the Jumbo frame. It is the easiest handled hive I ever tackled, and I have about run the gamut. The transfer of 39 colonies cost me some money and a lot of work, but I don't think I will ever regret going through it all.

"Yours sincerely,

"F. DUNDAS TODD."

BEEKEEPERS BY THE WAY



A teacher of Agriculture who is a beekeeper, fruit grower and gardener.

A Successful Teacher-Beekeeper

D. W. Spangler, of Longmont, Colo., is no eight-hour-a-day man. He does two days' work in one. As a teacher of agriculture and science, he does a full day's work in the school room, and later does another day's work with his bees or in his garden. He has been known to rise at 4 o'clock in the morning in order to do a half day's work at crating honey before time to go to the school room.

Spangler is a delightful fellow with a genial, winning personality, just the type of man needed in school work. Sometimes teachers of agriculture are sneered at as impractical, but not so Spangler. He makes more money out of the day's work he does in his garden and with his bees than he does from the day in the school room. Fact is he is reputed to make nearly double from his agricultural operations that the city pays for his services as a teacher.

Back east Spangler would be regarded as an extensive beekeeper with his 300 colonies of bees. Many a man puts in his full time with no more than that. Beside his bees and his school work he has several acres devoted to garden vegetables and fruits, and likes to put all the theories put forward in the text-books to the test of actual practice in his own grounds.

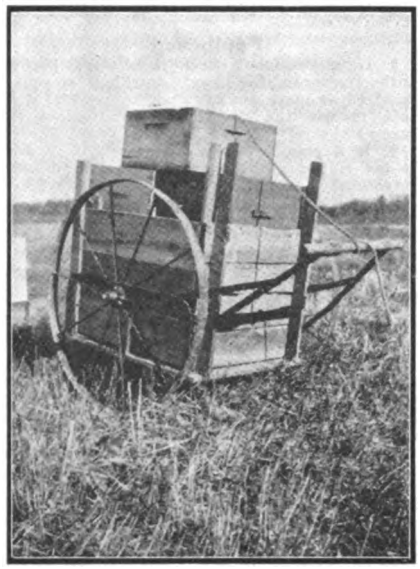
With all his activities he finds time for a brief vacation now and then and takes his family to his cabin in the mountains near Long's Peak, where the above picture was taken. It is a delightful place to go, as the writer has reason to know, having been a guest there.

A Useful Hive Cart

By H. W. Sanders

THE illustration shows a handy two-wheeled vehicle used in our apiary and found to be of great service. The actual gears and low platform are designed and sold for use of dairymen for the transfer of filled milk cans, and are of solid construction. The platform stands only a few inches from the ground and rests on a dropped axle, which in turn is borne by the large iron wheels. The handle for pulling or pushing is clearly shown in the photograph, and two small feet at the same end support the cart when at rest. A neighboring dairyman sold his stock last spring and we bought the cart at the sale, thinking it might be useful in the garden. Then when the time came for carrying around supers it seemed a bright idea to use the new outfit. The supers kept falling over and getting mixed up with the wheels whenever the cart went over a bump, so a few old boards were nailed around, forming a kind of box. .(The less said about the carpentry the better—but it works). In this, supers are piled and it will take as many as seven at a time. A rope is fixed to the far end of the platform and brought over the supers. It is held in the hand as the cart is pulled along and prevents the supers from falling out of the rear of the cart which is not boarded up. The iron frame is designed to carry great weights and will take a barrel of water, if needed. We have taken six heavy supers at a time to the honey house and find it a great improvement over a wheelbarrow. For next season we are planning to rebuild the body and to make it bee-tight with a bee-escape for use when robbers are troublesome. This year we took most of the crop before this time, and for the last few supers used the wheelbarrow.

Sturgeon Creek, Man.



Sanders' hive cart.

Bee Behavior and Queen Introduction

By Arthur C. Miller

IT is getting rather late to talk about queen introduction, at least for the northern part of the continent, but some of the recent articles on the subject have called to my attention the fact that there seems to be a decided lack of knowledge of the laws of bee behavior in their relation to a change of queens.

In the introduction of virgins the chief cause of loss lies in the queen herself, and the older she is the greater the chance of loss. A virgin put into a strange colony is prone to run out as soon as she is free to do so, and very often, if not usually, she fails to take her location, and so either is lost or wanders into some other hive, not infrequently superseding the reigning queen.

Long years ago Henry Alley got onto this and his invariable rule was to confine the virgin to the hive until she was quiet and settled, i. e., about twelve hours. His practice was to introduce the virgins near nightfall, close the entrance with coarse weeds that would shrink much in wilting and so automatically release the colony by the following morning. In his "baby nuclei," with a half-inch auger hole for an entrance, he closed it with a crumpled up plantain leaf, an abundance of which were to be found in his yard.

With laying queens the results are largely dependent on the condition of the receiving colony. If it is only recently dequeened, say a few minutes to two days, a laying queen taken from a nearby hive can be successfully introduced in most any way. If the queen has been long caged she is often lost the same as a virgin—by running from the hive. If the colony has been queenless long enough to have queen-cells well started, the results are quite variable, in fact impossible to prognosticate. Therein lies the variability of the results by the sundry cage systems of introduction. If the new queen is released within about three days after the removal of the old queen—not three days after putting the cage into the hive—the new queen is rarely lost. If it is longer, the bees very often continue with their queen-cells and "supersede" the new queen. If the cage is of the type pushed into the comb, giving the queen a chance to lay as the young workers emerge, the chance of supersedence is less. Or if the introduction takes place in the height of the flow—a wretched time to swap queens—the bees may continue the cells and swarm.

Just keep in mind the "behavior of the bees' and queen introduction, as well as many other operations, become simple.

Providence, R. I.

DR. MILLER'S ANSWERS

Feeding

I have 18 colonies which have not enough food to winter. As the season is very late, I can hardly give them syrup. Would you be kind enough to tell me which would be the best way to give them food for winter? Do you think that I should wait till I put them in the cellar and then put a cake of sugar mixed with a little cream tartar on frames and cover all with bags? QUEBEC.

ANSWER.—It is quite probable that as far north as you are, it would be too late to give the bees syrup now. The method which you suggest, to put candy over the combs, will be right.

To make the sugar candy, take best granulated sugar and stir into it a little hot water, in a dish on the stove. Don't let it burn, for burnt syrup is death to bees in winter. Keep trying it, and when you find that a little stirred in a saucer will grain, take it off quickly and pour into dishes, making cakes three-fourths of an inch to an inch and one-fourth thick. This can be used right over the brood-frames in winter. In this part of the country every girl knows how to make this sugar candy, and they call it "fudge." It is not hard, and the bees suck it readily. If it is properly made, it will be of a pale yellow color and fairly soft. There is no need of using tartaric acid in it. The tartaric acid is used only in sugar syrup, to keep it from crystallizing into a hard cake.

Bees Fighting

A very small swarm of bees emerged from one of my colonies. Not knowing which one it was, I let them go. After settling on a tree they returned and settled on a hive. The bees in the hive immediately began fighting them, and the ground was almost covered with dead bees in a short while. I smoked them well, which caused them to go into the hive, and it also stopped their fighting. Did I do the right thing?

Some have said that this was the parent colony; I do not believe it. What is your idea about it? OKLAHOMA.

ANSWER.—You certainly did what we would have done in your place. The smoking bewildered them and acted upon them just as when we smoke them to keep them from fighting us. We do not believe it was the parent colony that they joined, for they would certainly not have fought them. It is quite likely that that swarm came from some other apiary, if you could not find the colony from which they emerged in your own yard. Very often bees from away are attracted by the bees of an apiary and settle there, especially when they are in abnormal condition.

Did Dr. Bonney Move His Bees?

Some time ago I saw that the authorities were going to make Dr. Bonney remove his bees, and he was going to fight it. Did the case ever come to trial, and if so, what was the outcome? PENNSYLVANIA.

ANSWER.—Replying to the above: As soon as I heard of the action of our town council I went to the Mayor, and as I have a gunpowder temper, and it was at the explosion point, I said to him: "You tell the council to go to —— with its resolution." There never was a move made to make me move. I did build an 8-foot fence 40 feet long, in front of the honey house and part of the yard, as a sort of sop, but was not called on to do it, and did not feel obliged to. The most of this has now

been taken down, as I needed the lumber for other purposes.

The whole thing originated in spite work, because a man thought I killed his dog. He made a close guess. BONNEY.

Kind of Queens

What qualities are required for standard 3-band bees? If a queen is producing workers yellow to tip on under side, only 3 yellow bands across the back of abdomen, how should such bees be classified 3-bands, or goldens? Is there any such race of bees known as goldens? Where do our so-called golden bees spring from? I have several queens producing 5-band bees, but one I ordered from a golden breeder is producing about 90 per cent 3-band and not more than 10 per cent goldens, while the drones have four and five yellow bands. How should these be classified? I am inclined to believe our so-called golden bees are only sports from 3-band bees bred for their color. Am I right or wrong? ARKANSAS.

ANSWER.—You are right. Goldens are only Italian bees bred for color. So there is absolutely no positive standard, so far as I know. In some cases the lighter color is brought about through a cross with Cyprians and it is probably the cause of some of these golden bees being very cross. As a rule, golden Italian bees are as gentle as the average pure Italian.

Pure Italian bees are active, peaceable, show three yellow bands, including the narrow one next to the thorax. They hang quietly to the combs, when properly handled, and never crowd to the corners and drop off, as common blacks do.

Clipped Queens

In the case of queens with clipped wings, is there not the danger that the bees may still decide to swarm, and may ill-treat the queen on finding her unable to go with them. This happened in my case this season, and the queen was thrown out.

Will you advise:

1. What precautionary steps ought to be taken generally in the case of clipped queens?

2. What should be done if queen-cells are found in a hive with a clipped queen?

I adopted the Demaree system and shall be obliged if you will make your replies applicable to same.

ANSWERS.—1. I'm not sure that any precautionary measure should be used other than is used with queens unclipped.

2. Nor is there anything different to be done when queen-cells are found.

Yet in either case it makes a big difference whether queens are clipped or not. If a colony decides to swarm, and actually does swarm, if the queen's wings are whole, off goes the swarm, queen and all, if you are not on hand to hive it, and sometimes when you are on hand. If the queen is clipped, you can pick her up, and the swarm is at your mercy. The worst that can happen is that you may not find the queen, and she may be lost, but it is better to lose the queen than to lose both queen and bees. If a queen cannot fly, the the bees will swarm just the same, but the bees will return, and generally so will the queen. Then they may continue to swarm till a young queen emerges, when the old queen will be done for. But it's up to you to provide against that

Bees Get No Honey

I have 10 colonies to look after, and they have not made any comb honey this year. What is your idea as to their not making any honey?.

When is the best time to feed for winter? INDIANA.

ANSWER.—Bees can store surplus honey only as they can gather nectar from the flowers, and they cannot always get enough nectar. It may be too wet, it may be too dry, and sometimes when it seems neither too wet nor too dry, and when there are plenty of flowers, there is no nectar, and no one seems to know why. We just say it was a poor season and let it go at that.

The sooner you feed for winter the better, after you know the bees will need feeding, although in your locality you may feed even as late as October. November is a bit risky

Foulbrood

1. If a swarm of bees is affected slightly with European foulbrood and has stored a hundred or more pounds of honey, would it be safe to use the combs after extracting the honey?

2. Is it possible for a strong swarm of bees to get rid of a slight case of foulbrood after infection? IOWA.

ANSWERS.—1. Such combs are probably safe, and yet I should hesitate about using them in an apiary entirely free from the disease.

2. I think that has happened with European, but perhaps not with American.

Wintering

Last winter I wintered my 20 colonies without losing one, by putting a super on each filled with a chaff cushion and giving sufficient insulation, beside good winter stores. But this fall I intend to care still better for my friends, and thought it advisable also to put a super, empty or filled with inside fixtures, that is, without sections beneath the brood-hive. Would you advise me to do so? Would you leave that super empty or filled with the inside fixtures, or would you advise even to let sections partly or entirely finished within the super? By putting such a super under the hive I thought cold winds might be kept from the cluster. ILLINOIS.

ANSWER.—There should be advantage in having a story under the brood-chamber, but don't have sections in it, as it would spoil the sections for future use.

Decoy Hives—Lost Queens

1. Where a swarm leaves with a virgin queen and afterwards she is lost on her mating trip, what becomes of the swarm?

2. When using decoy hives, should I leave the comb in them? If I do, the moths will destroy them; if I don't, they would not attract the bees. PENNSYLVANIA.

ANSWERS.—1. If a virgin issues with a swarm and is lost on her mating trip, the bees are likely to return to their old home. Yet, for anything I know, there may be exceptions.

2. An empty hive without combs may serve, but it is better to have the combs. If moths attack them you can exchange them for fresh combs, giving the wormy combs to the bees to clean up.

(By using only one comb the moths are not as likely to trouble. More can be added as soon as a swarm is secured. New combs in which no brood has been reared are not so likely to be destroyed by moths as old combs. —F. C. P.)

Square Hives—Decoys, Etc.

1. Do you know of anyone using square hives who turns the frames crosswise of the entrance during the winter? If so, do they claim better wintering?

2 When frames are reversed (inverted), bees will fill the space between the comb and bottom bar, but will they not fill it with drone-comb? PENNSYLVANIA

ANSWERS.—1. No, we know of no one using a different entrance in winter. This is a much debated question in Europe, but we have never known it to be settled either way.

2. Yes, very probably.

Honey Fermenting

I have been interested in beekeeping for the past five years. I have a crop of honey that has me puzzled. I noticed the combs as I took them off of the hives. The cappings (not the entire comb, but about one-third or less) were puffed up high. I broke some of the cells open with a small piece of wood and I found the honey bubbled, or in a state of fermentation. I extracted this honey and bottled it, and three days after it showed signs of fermenting.

Will you please give me some information about this? What caused it to ferment in the comb? Is there anything I can do to save this honey, and still sell it as pure honey? ILLINOIS.

ANSWER.—It is very difficult to reply to this enquiry in a satisfactory manner. There is so much in the honey-producing business that we do not know. The best thing we can do is to give an instance of something similar, taken from the pages of the American Bee Journal for April, 1917. The editor, having called upon some leading eastern apiarists, was told by Mr. Irving Kenyon that for two years his honey had been fermenting in the cells and bursting the cappings. He thought it due to a microbe and thought of changing his combs, which probably carried the ferment over from one year to another. In June, 1918, page 205, he stated that he had made the change by shaking the bees from the combs and rendering the combs, and had less than one-fourth of one per cent of the trouble.

In your case it is probably only accidental. It is perhaps due to unripe honey, sealed too soon by the bees. We would advise heating the honey in a double boiler, "au bain-marie," as confectioners call it, taking care not to overheat it. Heating will remove the excess moisture and will also evaporate the gases formed in it. This will probably stop further fermentation. The honey can be sold as pure honey, but must not be offered as a good grade. It will very likely retain a little of the acidity of fermentation.—Editor.

Swarm Control for Comb Honey

I have given a trial to the plan as set forth in the August number of the Journal on page 266. The drones in the hive body at the side clogged the entrance into the other hive body completely, as I found when I opened it to exchange the empty brood combs with others from the mother hive. I had given some ventilation at the top of the hive at the side. But I found a lot of bees suffocated on the bottom-board, mostly drones, but also some dead worker bees. I therefore took the hive away from the side and placed it on top of the mother hive with an escape board between. Next day the upper hive body was still filled with bees. I left it on another day and night. But the workers had not left. So I proceeded to make an examination, and I found a virgin queen, a black queen, which took wing before I could catch her. The workers I shook from the combs in front of the mother hive and they entered at once. What became of the black queen? NEW YORK.

ANSWER.—The experience which you relate might have been expected in a colony having drones, since the only opening from the side hive was through a queen-and-drone excluder into the main hive. Mr. Smythe evidently did not have drones when he experimented in this way. So we can see that things do not always turn out as anticipated.

What became of the queen? It is not very easy to answer. Since she had never before taken a flight, it is quite probable that she got lost or went to another colony. In either case she would not survive.

Name of Apiary

In reading the last number of American Bee Journal I ran across your article "Bees in the Bush and Trout in the Brook," and I think that is the ideal name for the location I am in.

Your description of the trout streams is just like the ones we have here, and, Oh, Boy! the fishing is certainly unsurpassable.

Mr. Bartlett is surely not in as good a location as mine, for here we had a very heavy fall flow from goldenrod, buckwheat and boneset.

We are packing our bees for winter now, and hope to bring them through in good shape.

If you contemplate coming to northern Michigan again, come and see us in Oscoda County. We are in an ideal location for bees. Our heavy honey yielders are willow, dandelion, alsike and white clover, apple, June-

berry, wild cherry, basswood, raspberry, blackberry, buckwheat, goldenrod, fireweed and boneset. Can you beat it?

Can you think of a good name for my apiary? MICHIGAN.

ANSWER.—According to the census, your county appears to have the smallest population of any county in the State, 2,027. This indicates plenty of wild flowers, indeed. Why not call your apiary "Wilderness"?—C. P. D.

Extracting

Would it be asking too much for a brief sketch of the manner in which you do your extracting with reference to the two points mentioned below? I am now reaching a stage with my bees when kitchen methods of extracting are not adequate and I propose erecting a honey house. I propose using a Dadant uncapping can and running the honey from the extractor into a galvanized tin or iron tank, from which I shall draw it off as required. But I have formed no satisfactory ideas as to (1) rendering the cappings. and (2) disposition of the empty combs for the bees to clean out.

1. When the receptacle in which the cappings are rendered cools, I am unable to remove the wax without breaking it badly, and much of it sticks to the sides. I should like to know how this rendering is best accomplished.

2. When I replace my supers of empty combs upon the hives, the bees take possession and clean out the combs satisfactorily, but they won't vacate, and this means a lot of extra work in shaking them off again. In an outapiary this is a great inconvenience, as an extra trip or two is necessary. And, by the time this shaking is wholly accomplished, particularly if it be towards the end of the season, the bees are in an uproar and are apt to sting badly. If I pile the supers in the yard, I am apt to cause robbing. I should like very much to know your practice as to these two matters.

3. How do you get the bees out of the supers for extracting? BRITISH COLUMBIA.

ANSWERS.—1. When you render cappings, or any beeswax for that matter, you should have some flaring cans at hand, 2 inches wider at the top than at the bottom. We use cans that are 12 inches high and 14 inches wide at top. They hold about 40 pounds of wax. We pour about a quart of hot water in the can first, and then the hot beeswax. Let it cool slowly, and the residue will all be found at the bottom of the cake, except such things as dead bees, which ought not to be allowed to float on the wax, but should be skimmed off, in case any are there. You will find that, in cooling, the wax shrinks away from the sides of the can. Should any part of it stick fast, when cool, just turn the can over on a block and pour boiling water outside on the sticking spot.

2. This is a mooted question. Many apiarists prefer to put the supers out of doors, and let the bees clean them out. We do not like it. It excites the bees, and, besides, the neighbors' bees can help themselves, too. If you put an entirely empty super between the brood-chamber and the supers to be cleaned, the bees will not remain in them, unless the weather is so hot and the colony so populous that they can fill that empty super with bees. Usually we leave the supers on to be cleaned until our next trip.

3. We have found nothing equal to the Porter bee escape, to get the bees out of the super. It requires a trip to the apiary the evening before extraction, but it is well worth the trouble.—Editor.

Honey Disappeared

I have a colony of bees in a Langstroth hive. I fitted a Falcon 8-frame hive and placed it on top. The bees filled the 8 frames with honey and had it capped nicely. When I took it off today there was nothing but nice white combs, but no honey. Now I want to know what the bees did with it, and why they did it? PENNSYLVANIA.

ANSWER.—I would be inclined to say that the colony was robbed. But you say it is strong. So that cannot be it, unless you are mistaken about its strength. If it was robbed, there would be no honey in the lower hive either.

There is another guess, and that is that the upper hive combs were not filled full of honey, but were full only along the top edges. That is sometimes the case when a man does not look carefully or does not lift them out.

If you say it was neither the one nor the other, I am done guessing. You will be just as good as myself for the next guess.

Moths

I am a florist and I keep a few colonies of bees "for the fun of it." I double up every fall to keep the number of colonies down to 5 or 6. I find it impossible, with my knowledge, to preserve free from moths and larvæ my extra combs until swarming time the next year. I keep them in a closed chest in an outbuilding, but the worms are there ahead of me. What can I do? NEW YORK.

ANSWER.—There is a failure somewhere in your method. If the combs are free from eggs or larvæ of moths when put away, and the chest is well closed, they will remain exempt until exposed again. Perhaps your mistake is to think that they do not contain any traces of moths when put away. Often eggs are laid on the edges of combs by moths, which the bees would have removed if left in their charge.

Try a dose of carbon-disulphide spread on a rag in that chest, as you put the combs in it. Then give another dose in 3 weeks. If there are no living moths then, there will be none, for moths cannot stand a New York winter in an outbuilding.

When you take them out in spring, put them in charge of colonies of bees immediately.

Jumbo Hive—Demuth Winter Case

1. While examining my bees today (September 6), I found one colony which had one unsealed queen-cell with the larva about 4 days old, but no other brood or eggs in the hive. This queen was introduced in August and is still in the hive. Where did the eggs for the queen-cell come from, when there is no other brood in the hive?

2. How would a Jumbo hive be for comb honey, if I put in 9 frames spaced 1½ in. and a division board? Would it prevent swarming?

3. What do you think of the Demuth wintering case, when used with a 10-frame hive? MINNESOTA.

ANSWERS.—1. Your letter is not explicit, as you do not state when this queen hatched and whether she was introduced by you into another hive. Perhaps you do not mean that you *introduced* her, but simply allowed her to hatch there. There is considerable mystery about this. If I am to give an opinion it is that there was a queen already in the hive, about ready to lay, when you saw this larva in a cell. I would suggest that the egg in that cell was laid by a drone-laying worker and that this larva never matured into a queen, but died and was thrown out, as usually done by the workers in such cases.

2. A Jumbo used as you proposed would certainly be nearer a non-swarmer than a smaller hive. But you can never be entirely sure of preventing swarming.

3. The Demuth wintering case, with the frames on end, is very good. The only objection is the labor involved.

Feeding

I have two or three colonies of bees that will have to be fed this winter. Can they be fed on sorghum molasses? If not, what can I feed them, as I cannot get sugar? ILLINOIS.

ANSWER.—Molasses is death on bees in winter. It would be better to let them starve than to feed them on something that would kill them.

If you cannot get honey that you know to be free from germs of foulbrood, write to B. F. Kindig, President National Beekeepers' Association, stating your case. He will perhaps be able to help you out.

Queens

1. Can queens be reared in the same compartment with a young, vigorous queen without them casting a swarm upon the sealing of the first cell? That is, before they are strong enough to require another story?

2. About how many queens will ten nuclei mate in a month conditions being favorable?

3. What distinction do breeders make between untested and select untested queens?

4. Is it desirable to breed from a queen whose bees persist in building an extra amount of burr and brace comb, yet other points being in her favor?

5. What are some of the criticisms you have to offer in using a 10-frame hive body with three bee-tight compartments; the two outside ones having entrances facing the same way? AN AMATEUR.

ANSWERS.—1. Not if the colony is normal and the crop promising. As a rule, the queen will destroy the cells or the bees will prepare to swarm.

2. This depends upon your management. If a cell ready to hatch or a virgin is inserted in a nucleus, she will be likely to mate inside of a week or ten days. After that it is only 2 or 3 days before she begins to lay. I would say you might rear two queens a month, on the average, in each nucleus, conditions being favorable.

3. A select untested queen would be one that was large and very active.

4. The building of brace combs is probably due to accidental causes, hence would offer no objections. But if you really have such bees, it may not be advisable to breed from their queen.

5. A 10-frame hive body, divided into 3 bee-tight compartments with entirely full division-boards, would give less than 3 frames in each. They would probably do for nuclei.

Size of Hives

Up to date I have used the 8-frame hive with two stories for the brood-chamber, with the same result as reported by A. C. Miller in the American Bee Journal. Often have I found that bees gnaw down the cells in the lower stories and often combs are found in the spring with an abundance of pollen apparently too hard for the bees to remove. In consequence of this the queen goes to the second story and the lower is neglected or partly abandoned. This is a source of annoyance to the beekeeper. Combs are too expensive to melt them by the wholesale, and to clean them takes time, and "time is money." Last spring I took big bunch of these combs and soaked them for a whole day, then I took an awl and "plowed" up the pollen, running the awl through the cells near the middle of the comb. Combs treated thus were pretty well cleaned by the bees. However, I am apt to believe that the Jumbo hive would remedy this trouble considerably, because there is but one story, and they are almost compelled to clean up unnecessary pollen. I have always been in favor of a large brood-chamber and I was under the impression that two 8-frame hive-bodies would be all right, but now I see that it is not the right kind of a hive. So far I have made two Jumbo hives with standard frames, 10 for each hive. Is this the right number, or should I use more? Please state exact width of a standard Jumbo hive.

2. We winter bees on the summer stand under a shed, protected in winter on three sides, west, north and east. We do not use much packing at all, except a collapsible winter case for each. Do you think it would be advisable to use burlap over the frames, four-fold, with the cover put on loose to give a little top ventilation? INDIANA.

ANSWERS.—1. Bees do not usually place too much pollen in the brood-combs, unless they are queenless, or unless they have great op-

portunities to harvest pollen after brood-rearing has ceased. This is unusual. But when they have two brood-nests, it is quite probable that there is more storing in one of those nests than if they were confined on just the room they need for brood, and for winter food.

Your method of compelling them to clean out the pollen is ingenious and will probably be efficient. Usually there is plenty of demand for the pollen, in prolific colonies, unless it is mouldy and unfit for use, when spring comes

The Jumbo hive, such as is manufactured, has the great fault of having its frames spaced only 1⅜ inches from center to center, as already mentioned in these columns. The wider spacing of 1½, which we have recommended and which we use. is certainly desirable.

We are recommending a hive measuring 16⅜ inches in width inside, which takes freely 11 frames of the Hoffman style of the 1½-inch width. We do not use the Hoffman frame ourselves, but it seems to be popular. With a 11-frame hive, if you want to use only 10 frames in it you can use a division board in place of one of the frames, as we do. The 11 frame Jumbo has only a little more breeding space than the 10-frame Dadant standard hive.

2. Light burlap, with absorbents over it, is good. But don't let a current of air pass through.

What is a Bee Line?

There seems to be a very general impression that the honeybee on returning from the field, takes a direct route, flying in a straight line to the hive. So general is this idea that a "Bee Line" has come to mean a straight line between two points.

That bees often vary their direction, in unfavorable weather, there is little doubt. E. A. Welch, of Quincy, Ill., has bees on both sides of the Mississippi river near that place. The river is in the neighborhood of a mile in width at that point, yet the bees cross the stream in both directions. According to Mr. Welch, the bees follow both up and down stream on both sides to take advantage of the protection of the bridge when crossing in windy weather. The flight is very marked at such times, the bees scattering out in a fan shape and converging in the same manner at the opposite side of the stream.—F. C. P.

Lack of Information

I sold six colonies to a man who had just moved into the neighborhood. He said he used to keep bees. But two weeks ago he sent his son to me to ask if "bees carried honey on their hind legs?" He said he had been watching them for two days, and they were going into the hive with a lot of yellow stuff on their hind legs. I didn't laugh, but got my Langstroth on the Honeybee, revised by C. P. Dadant, and showed the son the anatomy of the queen bee, and advised his father to get Langstroth, revised, same as I did when I sold him the bees.

I don't know how a man can "keep" bees and not know where they carry their honey, and where they carry their pollen. I explained to the son that this yellow "stuff" was pollen, and these receptacles were little baskets, made for this very purpose.

Illinois.

Bees Are Dying

It is reported that H. A. Scullen, bee expert from the Washington State College, has visited the locality around Prosser, Wash., in an effort to determine the cause of excessive mortality among bees. Actual extinction of the industry is threatened, and several plans have been made to remedy the alarming situation. W. H. Tucker reports 80 colonies totally lost and 150 badly depleted, at a loss of from $10,000 to $12,000, which, of course, includes the possible honey crop, which promised to be a good one. E. E. Starkey reported 50 colonies entirely lost and others depleted, making his loss some $2,000. K. P. Runa said that of 25 thriving colonies he has not one left. Others report similar conditions. Dr. C. H. Ponting, another leading beekeeper, is preparing to remove his apiary immediately. It has been suggested that spraying the fruit-blooms with poisonous spray material may be one cause of the bee-mortality. It is hoped that the real cause may be discovered and a remedy found for it.

G. W. YORK.

A New Building at Guelph

The contract has been awarded for a fine new building to be devoted exclusively to the use of the beekeeping department of the Agricultural College at Guelph, Ontario. The building is to be two stories and basement, and will cost $40,000. When fully equipped it is thought the cost will total $60,000.

Work on the new building will begin at once and continue during the winter months. We congratulate Professor Millen and the college on the new building. We are informed that there are 260 freshmen students who are taking beekeeping at the Ontario Agricultural College this season.

Mating Experiment

A bee mating experiment was carried out last July by F. W. L. Sladen, Apiarist of the Dominion Department of Agriculture on Duck Island, at the eastern end of Lake Ontario. Duck Island is 8 miles from the nearest land and no bees are kept there. The results showed, among other things, that the queens mated by hand-picked drones, not more than about two weeks old, became drone breeders. They produced from less than 1 per cent to about 50 per cent of workers.

Carniola Today

As you know, I left Carniola, my country, 5 years ago, coming on purpose to study American beekeeping at the University of Minnesota.

I think I am very lucky to have all my folks living, when thousands of others have lost all their relatives in the new Jugoslav State (formerly belonging to Austria.)

My father wrote, in the last letter I received from him, that nearly 75 per cent of the bees died in Carniola on account of shortage of sugar and loss of men in this war. He himself lost over 400 colonies in 1917, this leaving him 870. Honey was selling way above the prices ever known; his honey was sold at 57 kronen, or about $10 a pound. Other goods are too high to be mentioned.

FRANK A. ROJINA,
State Farm, University of Minnesota.

Current Notes

Members of the Dubuque Branch or the Iowa Beekeepers' Association held their annual meeting at the home of George Spoerl, near Durango, Iowa, September 23.

There was a meeting of the beekeepers of the county held at Richland Center, Wis., October 10. Mr. McMurray, Assistant State Bee Inspecter, was present. James Gwin is Secretary.

A Community Bee Association has been organized at Owensboro, Ky., under the direction of H. R. Niswonger, bee specialist from Lexington, Ky.

Beekeepers of Grant County, Wisconsin (of which there are 250) will make an effort to secure one of the county bee meetings that is to be held during the coming winter.

Three-Day Meetings in Wisconsin

Interest in beekeeping in Wisconsin has become so pronounced, following the beekeepers' chautauqua held at Madison, Wis., last August, that H. F. Wilson, Secretary of the State Association, has announced a schedule of thirty 3-day meetings to be held in various parts of the State during the coming winter. These schools will be under the direction of H. L. McMurray, representing the United States Department of Agriculture, and will be held wherever an attendance of 25 persons is guaranteed. Meetings will begin during the present month.

Meeting

The Washington State Beekeepers' Association will hold its annual meeting in Seattle, January 22-24, 1920. For particulars write to the Secretary, H. Christensen, Toppenish, Washington.

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"Using no smoke or veil, I looked thru the hive containing your queen, which was as large as any I ever saw. Her ten frames of brood completely covered with yellow bees was as pretty a sight as one cou.. ever expect to see."—D. L. Shoaff, Shelbyville, Illino'

"Your bees are the best that I ever handled in my fifteen years of beekeeping."—Percy Saunders, Antigonish, Nova Scotia, Canada.

"Your queens are the most beautiful of any I have ever seen."—Kenneth L. Carlock, Baylis Illinois.

"The queen you sent me is such a beauty that I can hardly get her off my mind."—F. J. Rettig, Wabash, Indiana.

"The first lot of bees I got from you were fine, but the last were better yet."—J. H. Warren, Elliott, Iowa.

"The bees I got from you are the finest lot I ever saw and they don't try to sting."—Jacob Williamson, Riverton, Illinois.

"The queen I got of you a year ago was the only one in my yard that gave a surplus "—Albert Hass, Louisville, Kentucky.

"The queen I got of you is sure some worker. Her bees have made about three times as much honey as the others I have."—Henry Fromberg, Crandall, South Dakota.

"Your bees certainly are good stock."—H. L. Buchanan, Logansport, Indiana.

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Wisconsin Convention

The Wisconsin beekeepers will hold their annual convention at Madison on December 4 and 5, meeting in the Senate chamber at the Capitol building. An extended program has been provided and a good attendance is anticipated.

National Organization

At the last Convention of the National Beekeepers' Association the officers of the organization were authorized to call a meeting of delegates from the various States to be held at Kansas City, Mo., during the coming winter. This meeting will be held January 6-9, 1920. The meeting will be held in the Muehlbach Hotel, corner Baltimore avenue and Twelfth street, which will also be the headquarters of the delegates. It is of extreme importance that every State beekeepers' organization arrange for the sending of one or more delegates to this convention. The important matters which will be brought up for consideration have been discussed in previous issues of this Journal. Opponents as well as advocates of a reorganization of the National should be present in order that the recommendations which may be made to the National Beekeepers' Association may be consistent with the best interests of the beekeeping industry. The delegates should carry to the meeting at Kansas City credentials showing them to be the authorized representatives of the various organizations. This is of very great importance, as anyone who is not possessed of proper credentials will find himself without a vote in the meeting.

It appears to me that this meeting is to be one of the most important meetings of the beekeepers within recent years. The future of the National Beekeepers' Association will doubtless be outlined at this meeting. Everyone who is sincerely interested in beekeepers' organizations, whether of a co-operative nature or otherwise, should see to it that a delegate is appointed at the next meeting of the association, or if no meeting is to be held between now and January 6, that the officers of the organization appoint a delegate.

B. F. KINDIG,
President National Beekeepers' Association.

Cortland County Meeting

The Cortland County, New York, Beekeepers' Association held its annual fall picnic September 20, at the home of James Waters, Cuyler, N. Y. The principal address was delivered by George H. Rhea, Bee Specialist from New York State College of Agriculture.

Beginner's Bee Book

The "Beginner's Bee Book," by F. C. Pellett (Lippincott), is not a text-book. A text-book is a book which is intended for class instruction. The "Beginner's Bee Book" is rather an interesting account of the attractive side of beekeeping, its outlook, the advantages of honey production, together with short accounts of the division of labor in the bee family, the ways in which it is increased, the harvesting of honey, diseases, enemies and wintering problems. It ends with a short glossary. The book contains 180 pages and 17 illustrations. It sells at $1.25.—C. P. D.

Illinois Convention

The twenty-ninth annual meeting of the Illinois State Beekeepers' Association, will be held at Springfield, on the 9th and 10th of December, 1919. Notice is hereby given that at the last meeting it was voted that at the next meeting the matter of a change in the membership fee would be considered.

The program committee will arrange the best program they are able to secure, and send to the members on postals, as usual, and all who come will have a good time, certain.

Prizes as usual for essays. Let's have a crowd and a good time. Headquarters at the Leland Hotel.

JAS. A. STONE, Sec.

Tennessee State Meet

The Tennessee State Beekeepers' Association will meet in Nashville, December 11, 1919. Our editor hopes to be present. Particulars may be secured by addressing the Secretary, Mr. G. M. Bentley, at Knoxville, Tenn.

Indiana Convention

The Indiana beekeepers will hold their annual convention at the State House in Indianapolis on December 18 and 19. B. F. Kindig, Jay Smith and E. G. Baldwin are among the speakers named in a letter received from Secretary Ross B. Scott, who anticipates one of the best conventions ever held in that State.

Chenango County Meeting

A letter from Secretary T. R. Gorton announces the second annual meeting of the Chenango County Beekeepers Society to be held on December 20, at Norwich, N. Y. A good program will be provided and a good attendance is expected.

Chicago-Northwestern Meeting

The annual meeting of the Chicago-Northwestern Beekeepers' Assotiation will be held at room 138, in the Great Northern Hotel, Chicago, December 15 and 16, 1919. A good program is being prepared and will be mailed for the asking to anyone interested.

JOHN C. BULL, Sec.-Treas.,
Valparaiso, Ind.

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CASH for extracted honey, white or amber, in 5 or 10-lb. cans. Send sample and say price.
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The Forest Honey Co.,
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WANTED—To buy, comb honey.
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Edw. A. Winkler, Joliet, Ill.

FOR SALE—California Wonder corn for seed. A new white dent. Has averaged as high as six good ears per stalk, or over 300 bushels per acre. Also 50 tons of ensilage. A great money maker. Order now. Price 35c per lb.
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A. A. Lyons, Ft. Collins, Colo.

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FOR SALE—New crop clover extracted honey, two 60-pound cans to case, 25c per pound. Buckwheat and clover mixed, about half and half, 20c per pound.
H. G. Quirin, Bellevue, Ohio.

WANTED—White clover or light extracted honey. Send sample; state how honey is put up and lowest cash price delivered at Monroe; also buy beeswax.
E. B. Ross, Monroe, Wis.

WANTED—Comb and extracted honey; send sample of extracted and quote your best wholesale price f. o. b. your station, how packed, etc., in first letter. D. A. Davis,
216 Greenwood, Birmingham, Mich.

WE BUY HONEY AND BEESWAX—Give us your best price delivered New York. On comb honey state quantity, quality, size, weight per section and sections to a case. Extracted honey, quantity, quality, how packed, and send samples. Chas. Israel Bros. Co.,
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WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co.,
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M. E. Eggers, Eau Claire, Wis.

WANTED—An experienced man for 1920 to work outyards for bulk comb honey References required.
John W. Cash, Bogart, Ga.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
Superior Honey Co., Ogden, Utah.

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WANTED—Barnes Saw Table No. 4. Give particulars and price in first letter.
L. E. Miles, Box 407, Balboa, Canal Zone.

WANTED—To buy the sweet water from melting old combs or cappings.
Edw. A. Winkler, Joliet, Ill

WANTED—Cheap for cash, honey extractor, Winchester 12-gauge shotgun, Stevens double-barrel. Lorenzo Clark, Winona, Minn.

WANTED—For exhibition purposes, naturally built combs, partly or fully drawn out. Such combs should not have over 25 per cent drone comb and should be the product of the bees themselves, without use of foundation. Write us describing what you have and we will name our price on same.
American Bee Journal, Hamilton, Ill.

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Taylor, Box 127, Sacramento, Calif.

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Students' Bee & Honey Co.,
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WANTED—To correspond with beemen who can use black bees in gums with queens, or in packages without queens.
H. E. Sanders, Kentwood, La.

MISCELLANEOUS

WANTED—Beeswax, old combs and cappings to render on shares. Will pay highest market price and buy your share of the beeswax.
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